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Predicting health professionals' management of obesity.

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PREDICTING HEALTH PROFESSIONALS' MANAGEMENT OF OBESITY

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ABSTRACT

This thesis aims to examine cognitive predictors of practice nurses' management of obesity using a combination of structured models and to place providers' beliefs within the context of the patient. An integrated framework derived from the theories of self-regulation (SRT) and planned behaviour (TPB) was used to explore the role of self-related beliefs about behaviour and other-related beliefs about disease. Study one examines practice nurses' representation of obesity, behavioural expectancies and their weight management practices using a cross-sectional questionnaire (*N*=586). The results reveal beliefs about obesity are poor correlates of practice compared with self-efficacy and perceived success. Study two compares practice nurses' beliefs about obesity with their beliefs about behaviour using a combination of SRT and TPB (*N*=102). The results reveal self-efficacy to be the best predictor of intentions to raise the issue of weight loss and to mediate the impact of disease-related beliefs. Study three prospectively examines practice nurses' decisions to raise the issue of weight loss using the TPB (*N*=172). The results reveal self-efficacy and intentions to be the best predictors of behaviour. The final study examines concordance between practice nurse and patient regarding the consultation and expected outcomes using matched questionnaires (*N*=62). Although, the results reveal little concordance between patient-provider dyads regarding either the content of treatment or the outcome of care, degree of concordance was related to patient weight loss (*N*=26). Overall, self-related cognitions (ie. theory of planned behaviour) were more proximal antecedents of practice than other-related cognitions (ie. theory of self-regulation). However, the existence of provider-patient discordance indicates that health professionals' behaviour may not be translated into patient outcomes. The results are discussed with reference to cognitive

predictors of provider treatment behaviour, the integration of the representation of treatment with the representation of disease and the potential for understanding patient-provider communication within an integrated framework.

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Chapter 1

OBESITY AND OBESITY MANAGEMENT:

A ROLE FOR THE PRIMARY HEALTH CARE PROFESSIONAL

1.1. OVERVIEW OF CHAPTER

The focus of this thesis is on the relationship between health professionals' cognitions and their clinical weight control practices. However, the investigation of obesity management is predicated upon several priori assumptions: that weight and health are inextricably linked; that successful weight loss can be achieved and that health professionals influence patient outcomes. Therefore, this chapter will begin with an overview of the growing pressure to reduce the incidence of diseases related to lifestyle and the increasing role of primary care (in particular practice nurses) in the delivery of preventive services. To illustrate the potential role of obesity management in reducing the incidence of morbidity and mortality, this chapter will then examine the relationship between weight and health with a specific focus on cardiovascular disease. Via a discussion of the causes of obesity, the treatment options available and the efficacy of current interventions, it will be shown that obesity is a heterogeneous disorder with high rates of weight rebound demanding a proactive model of care from the primary health team.

1.2. THE CONTEXT FOR OBESITY MANAGEMENT IN PRIMARY CARE

1.2.1. THE CATALYST FOR OBESITY MANAGEMENT

Western medicine implicitly assumes that most deaths are premature, resulting from

conditions other than the natural biological aging of the body: most deaths are therefore assumed to be preventable (Department of Health, 1992*a*). Throughout the twentieth century industrialised countries have witnessed a decline in contagions as the main public health threat (eg. cholera, typhoid and measals) coextensive with a rise in the prevalence of non-infectious chronic diseases (Susser & Susser, 1996). The 'new epidemics' such as cancers and cardiovascular disease (CVD) jointly account for over half of all deaths in the UK before the age of eighty-five (Jacobson, Smith & Whitehead, 1994). Cardiovascular disease is currently the single major cause of mortality (Department of Health, 1992*b*; World Health Organization, 1990) despite falling trends over the last two decades (National Audit Office, 1996). With the identification of potentially modifiable 'lifestyle' pathogens in the aetiology of CVD (Ross, 1993) adjunct to the need for reducing rising health care costs (Baggott, 1994) the traditional medical approach with its emphasis on diagnosis and cure is too narrow: instead prevention and health promotion has become a key public health objective.

In the UK the emphasis on behavioural change as a preventive health strategy was reflected in the governments 'Health of the Nation' document (Department of Health, 1992*a*). The document set out a number of targets to increase life expectancy and reduce illness associated with 'preventable' causes of death primarily through the targeting of lifestyle related risk factors. The UK targets for health and nutrition proposed to reduce the proportion of obese men and women in the 16-64 age group by 25% and 33% respectively by 2005 from 1986/7 baseline. Despite criticisms that the targeting of lifestyle related risk factors understates the impact of environmental, genetic and perinatal influences (Carroll, Davey Smith & Bennett, 1996; Francome & Marks, 1996),

increases the potential for imputing blame (Brownell, 1991; Lupton, 1995; Peterson & Lupton, 1996) and arouses negative psychological sequelae (Stoate, 1989), the modification of 'unhealthy lifestyles' has nevertheless become a key public health strategy legitimising intervention prior to the presentation of pathology. Since, the responsibility of modern medicine extends beyond curing organic disease, a health care system able to effectuate wide scale population-based prevention is required.

1.2.2. THE DELIVERY OF OBESITY MANAGEMENT

The change in emphasis from treatment to prevention has been actively supported by the shift towards a primary-care led national health service (Baggott, 1994). In contrast to the traditional curative or hospital-based health care system where intervention is largely dictated by the presence of disease symptomology, general practitioners (GPs) in the UK are contracted to the National Health Service to provide general medical services for their registered patients constituting the first contact point for care. Since more than 90% of the population consult their GP at least once every three years (Stott & Davis, 1979), the opportunity exists to impact on both the risk of disease in the 'high risk' individual, and the average levels of risk in the population (Johns, Hovell, Ganiars *et al.*, 1987; Lewis, Assmann, Mancini & Stein, 1989; Oldenburg, 1994). Not only do the circumstances for wide spread intervention exist within general practice but the primary care team are considered a credible source of health information (Fullard, Fowler & Gray, 1984; Hiddink, Hautvast; van Woerkum *et al.*, 1997).

1.2.3. THE ROLE OF PRIMARY CARE

Therefore, with the existence of a suitable means for delivery of preventive health care,

a series of legislative changes has served to define the role of general practice in the implementation of public health promotion strategies. Primary health care professionals have been encouraged to play a greater role in prevention on the premise that prevention offers greater long-term health gains (Department of Health and Welsh Office, 1989). The Health of the Nation document identified two ways for the primary care team to promote health: through opportunistic health promotion when the patient is attending surgery for another purpose and through designated health promotion clinics (Department of Health, 1992*a*). With the introduction of the 1990 contract for GPs, practices were formally required to provide a variety of preventive services including the performance of lifestyle checkups on all new and existing patients every three years (Department of Health, 1990). The requirements of health checks laid down in the contract included documenting of the following parameters: blood pressure, height and weight, urine analysis, smoking habits, alcohol consumption, exercise, diet and family illness. This led to an unprecedented growth in health promotion clinics (Cummings, 1991; Hannay, Usherwood & Platts, 1992) and health checks (Bain, 1991) within general practice. With the introduction of the 'new health promotion package' in 1993 (General Medical Services Committee, 1993) which was explicitly linked to the aims of the Health of the Nation, the emphasis on health promotion was further shifted towards opportunistic intervention. The document aimed to encourage practice nurses and GPs to use the opportunity of consultations to assess risk factors and offer lifestyle advice in patients who are not immediately at risk. These requirements made it clear that health promotion and illness prevention were formally within the range of general medical services and were accompanied by a financially driven banding system with 90% of practices opting for the highest band (Department of Health, 1995*a*). The dual

focus of disease surveillance and health maintenance via lifestyle monitoring and change requires the primary health care teams to become proactive in the management of patient care rather than reactive as their traditional role had demanded.

1.2.4. THE ROLE OF THE PRACTICE NURSE

Consonant with the shift in emphasis from secondary care to primary prevention in general practice, the governments' White paper 'Promoting Better Health' (Department of Health, 1987) gave GPs incentives to increase the employment of nursing staff leading to a threefold increase in the numbers of practice nurses in England and Wales since 1987 (Atkin, Porter, Lunt & Hirst, 1993). As a consequence of the new GP contracts practice nurses were formally given the opportunity to become involved in health promotion work. Such a move represented a continuation of the process of task delegation from GPs to practice nurses (Bowling, 1981). Opportunistic health promotion is now accepted by patients as an integral part of the practice nurses' role (South Tynside Patient Satisfaction Workshop, 1995). Practice nurses now undertake the majority of routine health promotion work within primary care (Coulter & Schofield, 1991; Georgian Society, 1992; Robinson, Beaton & White, 1993; Peter, 1993; Armstrong, Tavabie & Johnston, 1994) and their involvement in health checks, opportunistic intervention and a range of specialised clinics have risen dramatically (Peter, 1993). For example, practice nurses have been identified as the most likely professionals to be consulted about diet, exercise and weight control (Health Education Authority, 1995*a*) and weight management is one of the commonest health promotion clinic activities engaged in by practice nurses (Ross, Bower, & Sibbald, 1994, Hibble, 1995). Moreover, practice nurses' involvement in routine health checks often position

them as 'gate keepers' deciding when and who will receive further management as part of shared care (Lindsey, Robb & Gaw, 1995). Therefore, practice nurses have become key health care professionals involved in the delivery of obesity management and current health promotion policy.

1.3. THE DEFINITION OF OBESITY AS PROBLEMATIC

1.3.1. THE MEASUREMENT OF THE PROBLEM

Obesity is defined as excessive amounts of body fat (adipose tissue). Although, adiposity can be classified in several ways (in terms of differences in body fat patterning and differential hormonal and metabolic profiles, Bouchard, 1991), in both clinical practice and research it is usually indexed as weight: either divergence from average weight for height or an optimum height/weight ratio (ie. body mass index). The body mass index (BMI) which is calculated using the equation weight kg/height m^2 is currently the most commonly used indicator of obesity. Using BMI degree of obesity is categorised as follows: BMI 20-24.9 (Grade 0 obesity or acceptable weight); BMI 25-29.9 (Grade I obesity or overweight); BMI 30-40 (Grade II obesity or obese) and BMI > 40 (Grade III obesity or severely obese).[1] This is the classification system adopted by general practices (Field & Henderson, 1993) and recommended to practice nurses (Tettersell, Sawyer & Salisbury, 1992). However, although widely used the BMI does not take into account body fat patterning: a high BMI may be due to fatness, shortness or both (Michels, Greenland & Rosner, 1998). Moreover, without any change in BMI

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[1]This classification system is known as the European System but the alternative American system of grades of obesity (ie. Grade 0 = BMI 20-24.9, Grade I = BMI 25-29.9, Grade II = BMI 30-35, Grade III = BMI 35-40 and Grade IV = BMI >40) is also widespread (Bray, 1992a).

percentage of body fat can vary by ± 5% (Hannan, Wrate, Cowen & Freeman, 1995). Throughout this thesis the descriptive terms overweight or obesity will be used to refer to a BMI >24.9 unless otherwise stated.

1.3.2. THE SCALE OF THE PROBLEM

Epidemiological studies in most western countries indicate that the prevalence of overweight and obesity is high and rising among both adults and children. In the UK, the proportion of adult men and women classified as obese based on a BMI >29.9 doubled in the decade between 1980 and 1990: by 1991 12% of men and 15% of women were classified as obese (White, Nicolaas, Foster *et al.*, 1993). Since the publication of the Health of the Nation in 1992 the prevalence of overweight and obesity has continued to increase steadily (National Audit Office, 1996) making the target of reducing obesity by 25% for men and 33% for women 'particularly challenging' (Department of Health, 1996, p. 33). In 1986-1987 37% of men and 24% of women were overweight (BMI >24.9). Recent government figures show that 44% of men and 32.9% of women are currently overweight and a further 15.3% of men and 17.5% of women are obese (Department of Health, 1997), although the prevalence is higher in lower socioeconomic groups (Sobal & Stunkard, 1989; Blaxter, 1990). Comparable levels of overweight and obesity have been reported within primary care populations (Silagy, Muir, Coulter *et al.*, 1993) suggesting a need for intervention according to accepted clinical practice.

1.3.3. THE PATIENTS VIEW OF THE PROBLEM

The existence of a need to intervene according to accepted clinical practice does not mean that patients want advice (Stott & Pill, 1990) or are ready to change (DiClemente

& Prochaska, 1985). Overweight individuals suffer prejudice and discrimination as a consequence of a society in which extreme thinness is highly valued and obesity is considered a socially stigmatising condition (DeJong, 1980; 1993; Rothblum, 1992; Lundberg & Sheehan, 1994). Research suggests that obese patients (BMI > 25.9) are generally aware they are overweight and 78% of them are aware of the health risks (Little, 1998). For example, a survey of 47 group practices in England and Scotland involving 25,496 men and 36,657 women found that 34% of women and 24% of men felt they had a weight problem (Wallace, Brennan & Haines, 1987). Further, 67% of men and women thought their GP should be interested in their weight. Similarly, of 1,215 patients surveyed about their views on lifestyle advice, only 16.8% stated that they did not want weight management advice and 19.3% did not want advice on exercise (South Tynside Patient Satisfaction Workshop, 1995). Investigation of the relationship between readiness to change and actual risk status, reveal only 20% of overweight patients and 45% of obese patients identified as having a high fat intake perceived their current diet to be harmful to their health, suggesting a need to raise risk factor awareness among some primary care patients (Silagy *et al.*, 1993). However, 66% of overweight and 88% of obese patients said they wanted to change their diet or lose weight. Moreover, 46% of overweight patients and 66% of obese patients reported attempting to modify their behaviour in the last year. Of those with a BMI greater than 29.9 and who perceived their diet to be harmful, 98% indicated a desire to change and 76% reported having tried to do so during the last year suggesting motivation for change is high. Therefore, in terms of population-based prevention in general practice it would appear the opportunity and motivation for change exists; not only are patients concerned about their weight but they would appear to welcome relevant counselling from the

primary health care team (Schauffler, Rodriguez, & Millstein, 1996).

1.4. CONSEQUENCES OF OBESITY: THE RELATIONSHIP BETWEEN WEIGHT AND HEALTH

1.4.1. ALL CAUSE MORBIDITY AND WEIGHT

The medical risks associated with obesity (particularly those in the upper weight limits) include an increased prevalence of musculo-skeletal problems (eg. osteoarthritis); respiratory problems (eg. depressed pulmonary functioning and sleep apnea); metabolic and endocrine diseases (eg. gallbladder disease, non-insulin-dependent diabetes mellitus and hyperlipidemeias); certain types of cancer (eg. colorectal) and CVD (eg. coronary heart disease and stroke) (for recent reviews of the health risks of excess adipose tissue see Bray, 1996; Kannel, D'Agostino & Cobb, 1996; National Institutes of Health Consensus Development Panel on the Health Implications of Obesity, 1985; Pi-Sunyer, 1991 and Sjöström, 1992*a*). Since CVD represents one of the commonest causes of patient consultations with their GP or practice nurse (Department of Health, 1998) the evidence regarding the relationship between weight and cardiovascular health will be examined more closely. Rather than reiterating the substantial reviews regarding the health risks of obesity, this section will concentrate on the implications of the main research findings for public health strategies.

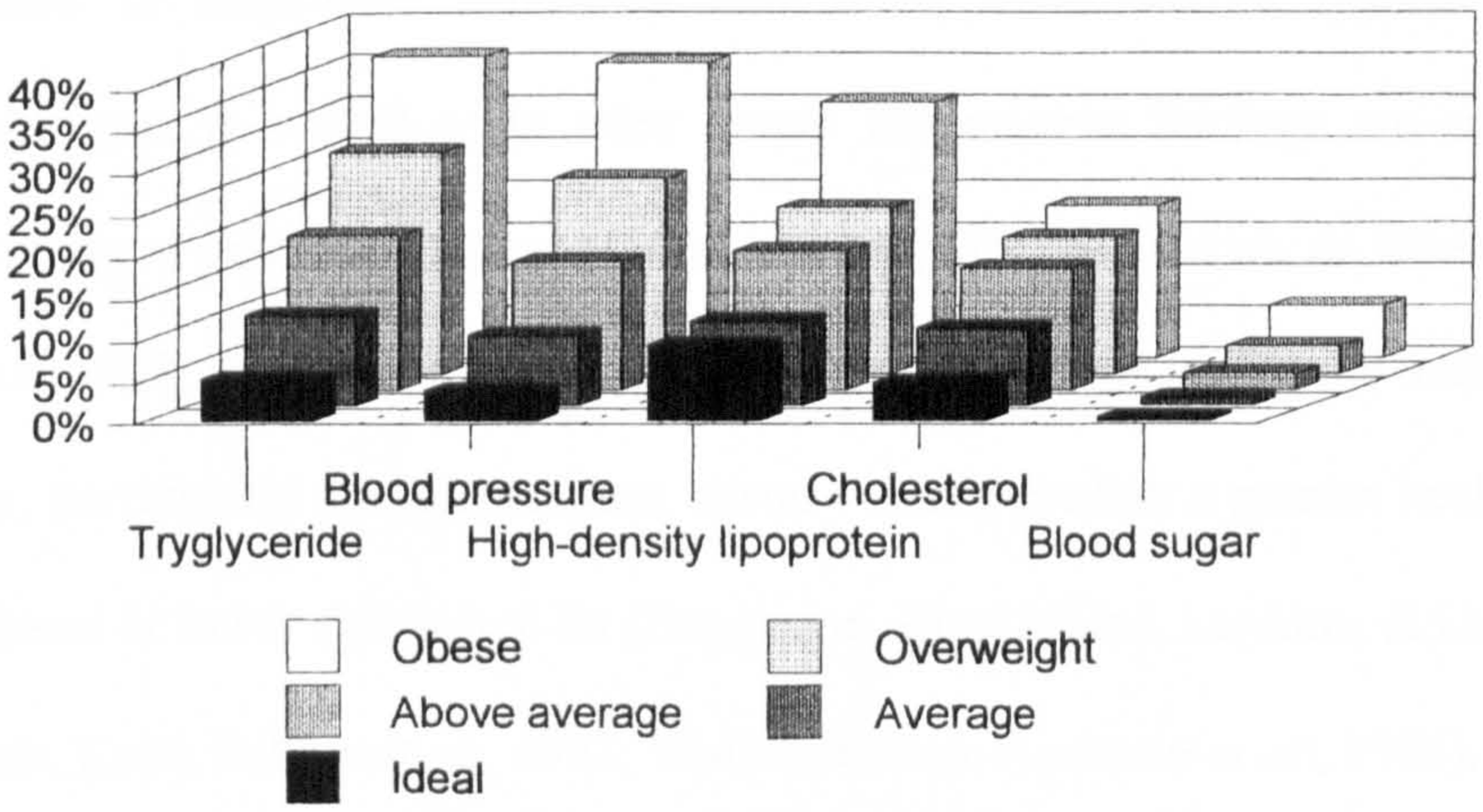
1.4.2. WEIGHT AND CARDIOVASCULAR RISK FACTORS

Increased risk of CVD is associated with an imbalance in several biologic parameters including reductions in low-density lipoproteins; increases in total serum cholesterol;

high blood pressure (BP) and non-insulin dependent diabetes (NIDDM) (Castelli, 1996). Excess adiposey is closely related to several of these known cardiovascular risk factors including hypertension (McCarron & Reusser, 1996); NIDDM (Pi-Sunyer, 1996; Njølstad, Arnesen & Lund-Larson, 1998) and blood lipid disturbances such as high total serum cholesterol, decreased low-density lipoproteins and high levels of triglycerides (Law, Wild & Thompson, 1994; Gardener, Fortmann & Krauss, 1996). Although, most physical problems are mainly associated with severe obesity (BMI> 29.9), the likelihood of metabolic and lipid abnormalities characteristic of the atherogenic risk profile steadily increases as a function of weight (Kannel *et al.*, 1996; Garrow, 1991; Lewis *et al.*, 1989, see fig 1.1). The metabolic changes associated with an ongoing positive energy balance and excess adipose tissue storage provides a plausible causal mechanism through which obesity leads to increased atherosclerosis and cardiovascular morbidity (Bray, 1992*a*, Sjöström, 1992*a*, Kannel *et al.*, 1996).

Fig 1.1: Frequency of lipid abnormalities by weight category

Adapted from Lewis et al., 1989 (men only)



1.4.3. WEIGHT AND CARDIOVASCULAR DISEASE (CVD)

In addition to the relationship between obesity and the prevalence of cardiovascular risk factors, numerous studies report a direct relationship between weight and the prevalence of CVD and mortality (eg. Willett, Green, Stamfer *et al.*, 1987; Wannamathee & Shaper, 1990; Paffenbarger, Hyde, Wing *et al.*, 1993; Manson, Willett, Stampfer *et al.*, 1995; Jousilahti, Tuomilehto, Vartiainen *et al.*, 1996). Even modest weight gained in adulthood further increases the risk of cardiovascular mortality proportional to adiposity accrual (Manson *et al.*, 1995). However, the relationship between obesity, CVD and mortality has not been observed in all studies or all subgroups (Dorn, Schisterman, Winklestein & Trevisan, 1997; Bender, Trautner, Spraul & Berger, 1998). Therefore, the question of whether excess weight is directly atherogenic and causally related or simply a marker of a high-risk profile by virtue of its common association with other known cardiovascular risk factors is still debated (Pi-Sunyer, 1991). Nevertheless, the preponderance of long term perspective studies suggests obesity is an independent long-term risk factor in producing morbidity and mortality from CVD; null results are largely confined to short-term follow-up and small scale studies (Sjöström, 1992*b*). Furthermore, it is unclear to what extent inconsistent findings are an artifact of measurement error as a consequence of using BMI (Kissebah & Krakower, 1994; Seidell, 1992; Sjöström, 1992*b*).[2] Research suggests fat found in the intra-abdominal cavity, particularly visceral adipose tissue volume confers a greater health risk than peripheral or lower abdominal fat (Bengtsson, Bjorklelund, Lapidus, & Lissner, 1993; Folsom, Kaye, Sellers *et al.*, 1993; Walker, Rimm, Ascherio *et al.*, 1996).

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[2]Although BMI reflects total fat mass waist hip ratio is a better correlate of abdominal adipose tissue volume (Bouchard, Bray & van Hubbard, 1990) and waist circumference the best predictor of visceral adipose tissue (Ross, Rissanen & Hudson, 1996).

1.4.4. THINNESS AS A HEALTH RISK

While the debate over whether excess weight is a risk factor independent of its atherogenic components is academic from a public health point of view (a reduction in risk factors will clearly lead to a reduction in the incidence of cardiovascular disease), the issue of where in the excess-weight spectrum specific risks begin is important in defining a level for intervention. However, the exact nature of the relationship between weight and CV mortality is not necessarily linear. Numerous studies have reported a J-shaped (eg. Folsom *et al.*, 1993) or U-shaped (eg. Harris, Cook, Garrison *et al.*, 1988) relationship between weight and poor health outcomes. The existence of a J-orU-shaped relation between body weight and mortality suggest mortality increases sharply at the two extremes of the weight spectrum: only being either overweight or underweight (BMI <19.9 and >29.9) would appear to carry significant health risks. Thus, the health consequences of the mildly to moderately overweight remain controversial.

1.4.5. CONFOUNDERS OF THE WEIGHT HEALTH RELATIONSHIP

In recent re-examinations of the relationship between body weight, CVD and mortality, (Manson, Stampfer, Hennekens & Willett, 1987; Sjöström, 1992*b*) the existence of several sources of confounding within existing research has been espoused as an explanation for poor health outcomes at low body weights. These include the following: inappropriate statistical adjustment for the biological effects of obesity, insufficient examination of obesity subgroups (eg. abdominal obesity) and inadequate control for past weight loss and subclinical disease. Evidence suggests BMI is inversely related to mortality from non-cardiovascular diseases such as cancer, cirrhotic and respiratory

disorders (Rissanen, Heliovaara, Knekt *et al.*, 1989; Wannamethee & Shaper, 1990; Stamler, Ford & Stamler, 1991), suggesting that underweight may be symptomatic of pre-existing disease reflecting behavioural correlates of leanness. These findings are important in the light of recent research that suggests the relationship between weight and CVD mortality is mediated through smoking status. A linear relationship between weight and health emerges after eliminating confounders such as subclinical disease: in comparison to the leanest participants (BMI< 19) higher mortality rates were apparent even for average and mildly overweight participants (Manson, *et al.*, 1995). Therefore, biologic and lifestyle pathogens that contribute both to leanness and risk of death (ie. smoking and alcohol consumption) may have led to a confounding of the weight-health relationship in earlier research overstating the risk of underweight and understating the risk of overweight.

1.4.6. WEIGHT VARIABILITY AS A HEALTH RISK

Although obesity and weight gain lead to increased mortality and morbidity, weight loss may also be hazardous to health. Epidemiological research suggests greater weight variability is associated with increased risk of CVD and mortality independent of obesity and the trend of body weight over time (Lissner, Odell, D'Agostino *et al.*, 1991; Pamuk, Williamson, Madans *et al.*, 1992). In a population based prospective study of middle-aged men from seven European countries the lowest mortality rates were found among those who maintained a constant body weight: decreasing, increasing and fluctuating body weights were all associated with an increased risk of mortality (Peters, Siedell, Menotti *et al.*, 1995). Similarly, the Iowa Women's Health Study found that risk of death was highest in women who had a large weight loss (>10%) or a large

weight change (>10% loss-gain or gain-loss) compared with stable weight women (within 5%) (Folsom, French, Zheng *et al.*, 1996). Therefore, the research suggests that weight cycling (both loss-gain and gain-loss variability) increases cardiovascular risk, a position that is problematic for obesity management that aims to bring about weight loss. This has led some authors to raise serious questions about the treatment of obesity, in particular the treatment of the mild to moderately obese (eg. Wooley & Wooley, 1984).

1.4.7. INTENTIONAL WEIGHT LOSS AND HEALTH

In a recent systematic review of epidemiologic studies of weight cycling Williamson (1996) found that since information regarding the possible causes of weight variability were absent from existing research, pre-existing disease cannot be precluded as a cause of both weight fluctuation and poor health outcomes. For example, in some studies the increased risk of weight cycling has been restricted primarily to the first BMI tertile (BMI <26.08, mean BMI = 24.20) suggesting that other factors such as poor health may be responsible for weight loss (Blair, Shaten, Brownell *et al.*, 1993). Hence, concluding that intentional weight loss is detrimental to health on the basis of existing research is premature (Jeffrey, 1996). Particularly since weight loss in populations with weight related comorbidities have found that intentional weight loss leads to reduced mortality and significant improvements in a variety of cardiovascular risk factors. For example, Wing, Jeffrey and Hellerstedt (1995) found no negative effects of weight cycling on cardiovascular risk factors among a group of subjects enrolled in a weight loss program over a 2 ½ year period: weight gain was associated with a worsening of the cardiovascular risk profile while weight loss was associated with a decrease in risk

factors. Similarly, intentional weight loss in obese diabetics and hypertensives is associated with longer survival (Lean, Powrie, Anderson & Garthwaite, 1990; Wannamethee & Shaper, 1990). Moreover, improved life expectancy in operated obese patients has been reported as approaching actuarial standards of the general population (Kral, 1992).

Furthermore, weight loss does not necessarily have to be extreme: evidence suggests that even comparatively minor degrees of weight loss (eg. less than 10% of initial body weight) can lead to significant health benefits (Blackburn, 1995). In a recent systematic review of current literature SIGN (1996) estimated that a 10kg weight loss results in a 20% reduction in mortality from all causes, 30% from diabetes, 40% from obesity related cancer; a 10-mmhg reduction in systolic BP; a 20-mmhg reduction in diastolic BP; a 50% reduction in fasting glucose and a 10% reduction in total cholesterol (Hunter, 1997). Thus, overall the evidence suggests the potential risks of intentional weight loss do not outweigh the substantial health benefits afforded by a reduction in obesity.

1.4.8. THE IMPLICATIONS FOR EVIDENCE-BASED MEDICINE

Recent trends in health care emphasise the need for modern clinical practice to be evidence based (Rosenberg & Donald, 1995; Sackett, Rosenberg, Gray, Haynes & Richardson, 1996). Given the significant health consequences of obesity and the potentially deleterious effect of large weight losses, recommendations from the American Foundation's Expert Panel on Health and Weight agreed that prevention of overweight and further weight gain must be the ultimate goal (Godfrey Meisler & St Jeor, 1996). Similarly, in the UK a recent report by the Department of Health concluded

that 'as a first step, attention should be directed towards the prevention of obesity rather than its treatment' (Department of Health, 1996, p33; 1995*b*). Attempts to quantify the optimal weight for health have been variable. Currently, the Royal College of Physicians suggest a healthy BMI target of 24.3 for men and 23.9 for women (Faculty of Public Health Medicine, 1992). However, population weight guidelines although useful as a screening test, are not advocated as individual weight loss goals (Abernathy & Black, 1996; Brownell & Wadden, 1991).

1.5. CAUSES OF OBESITY AND WEIGHT GAIN: CURRENT THINKING ON THE AETIOLOGY OF OBESITY

1.5.1. ENERGY REGULATION

Obesity can be considered as consisting of a dynamic phase in which weight is gained and a stasis phase in which maintenance of gained weight occurs. However, obesity develops initially as a result of an imbalance between energy intake (food intake) and energy expenditure. Very small imbalances over time can have a large cumulative effect: a 2% daily excess of energy intake over expenditure during the course of a year will result in a 2.3kg (5 lb) weight gain (Rosenbaum, Leibel & Hirsch, 1997). An ongoing positive energy balance and adiposity storage leads to changes in hormone secretion and action. Homeostatic mechanisms regulate energy balance keeping the difference very close to zero once a weight maintenance plateau has been reached. Nevertheless, the reasons explicated to explain why some people have a positive energy balance have been various.

1.5.2. ENERGY INTAKE

Calorie intake

The simplest explanation for a positive energy balance is dietary in origin. However, as a population total energy intake in the UK has declined over the last decade (Prentice & Jebb, 1995). Moreover, at an individual level assessing the aetiological significance of eating behaviour is problematic. Many studies rely on self-report which may be unreliable, use pre-existing subgroups (eg. obese, overweight, normal) and short term correlational studies that may either fail to capture small energy imbalances or fail to differentiate between maintenance and weight gain (Mela, 1996). Thus, inconsistencies exist regarding research examining calorie intake. Although, food balance studies performed in metabolic wards and using direct observation suggest the obese do eat more (Lichtman, Pisarska, Berman *et al.*, 1992), such subjects represent a distinct subgroup of obesity often with an accompanying eating disorder such as binge eating (Fitzgibbon, Stolley & Kirschenbaum, 1993) making extrapolation problematic. However, studies investigating calorie intake through the direct observation of food consumption appear to confirm earlier findings that the obese do not consume more calories than their non-obese counter parts (eg. Leibel & Hirsch, 1984). Further, reported energy intake in obese and lean individuals are very similar on an absolute basis and significantly lower in the obese when expressed as body weight (Prentice, Black & Coward *et al.*, 1986). In addition, responses to short-term overfeeding, suggest that some individuals are more at risk than others to gain fat when energy surplus is held constant (Bouchard, 1993). Therefore, individuals of comparable age and height with widely different food intakes may nonetheless support the same body weight (Rolland-

Cachera & Bellisle, 1986). Nevertheless, to achieve weight loss a calorie deficit is required and calorie intake requires assessment as a first stage of treatment. While consideration should be given to under reporting of food intake (Klesges, Eck & Ray, 1995), health professionals need to be aware that for some patients with a history of weight cycling food intake may be lower as a result of alterations in metabolic rate (see discussion of resting metabolic rate below).

Eating patterns

If the obese do not consume more calories than their thinner counterparts, do they eat differently? Despite attempts to define an 'obese' eating style, the results of investigations of dietary patterns and preferences have overall been inconsistent (Mela, 1996). For example, it is unclear whether reduced meal frequency is a consequence of weight gain rather than a cause. Moreover, although 'restrained' eating patterns may have implications for obesity treatment in terms of food-regulation, its aetiological significance in weight gain remains unlikely: research suggests only a subpopulation of restrained eaters 'counterregulate' or overeat after violations of dietary restraint (van Strien, 1996; Williams, Michela, Contento *et al.*, 1996; see 'problems with dieting' below). However, although eating style is unlikely to lead to the development of obesity serious consideration should be given to eating patterns in assessing patients for weight control (Wardle, 1995). Obese binge eaters are a distinct subgroup with identifiable clinical features and particular treatment needs (St.Jeor, Brownell, Atkinson *et al*, 1993) and have recently been included as a new diagnostic subcategory "binge eating disorder" of eating disorders in the Diagnostic and Statistical Manual of Mental Disorders-IV (American Psychiatric Association, 1994). The level of identifiable binge

eaters in practice populations is estimated to be approximately 6.9% (Whitehouse, Cooper, Vize *et al.*, 1992). Therefore, assessments of patients' eating patterns may prove useful in identifying eating disorders, which require cognitive behavioural therapy as an adjunct to weight management to help alleviate the accompanying mood and body image disturbances.

Dietary composition

Investigators have recently turned towards exploring the macronutrient and micronutrient composition of the diet. The lowest prevalence of obesity is found in those with a low fat to sugar ratio as a consequence of the 'sugar-fat seesaw' whereby there is an inverse reciprocity between sugar and fat consumption (Crombie, 1997; Prentice & Jebb, 1995; Tucker & Kano, 1992). Although changes in total energy intake will alter body weight if energy expenditure is constant, dietary fat is converted to bodily fat with 25% greater efficiency than is carbohydrate (Schutz, Flatt & Jequier, 1989; Crombie, 1997). The epidemiological, prospective and cross-sectional studies of fat intake and obesity have recently been reviewed (Lissner & Heitmann, 1995) and generally support a relationship between fat intake and obesity (eg. Colditz, Willett, Stampfer *et al.*, 1990; Rissanen, Helliovaara, Kneckt *et al.*, 1991; Klesges, Klesges, Haddock & Eck, 1992; Tucker & Kano, 1992; Larson, Tataranni, Ferraro, & Ravussin, 1995) with notable exceptions (Parker, Gonzalez, Derby *et al.*, 1997). More recently, longitudinal analysis indicates that high fat intakes are associated with weight gains only in subjects predisposed to obesity as measured by the presence of an overweight parent and despite base-line weight status (Heitmann, Lissner, Sørensen & Bengtsson, 1995). Therefore, dietary composition may not have a major role in the pathogenesis of obesity

for the majority of the population (Mela, 1996). Nevertheless, documenting dietary intake to assess both daily caloric intake plus nutrient composition is an important part of weight management. Particularly, since high dietary fat increases the risk of cardiovascular events (World Health Organization, 1990). Improvement in diet may be a valuable therapeutic outcome even where significant weight loss cannot be achieved.

1.5.3. ENERGY EXPENDITURE

Fuel utilization

Since it would appear that dietary intake does not provide an adequate explanation for the development of obesity, it has been proposed that obesity is an adaptive response to a high fat diet with the necessary equilibration of fat intake and oxidation being achieved through expansion of fat stores (Astrup, Buemann, Toubro & Raben, 1996). Fat oxidisation capacity has a metabolically driven genetically determined component. A high respiratory quotient (RQ) as a reflection of low fat oxidation relative to carbohydrate oxidization has been found to predict subsequent weight gain (Seidell, Muller, Sorkin & Andres, 1992) although explained variance is generally less than 10% (Schutz, 1995). Such a permissive metabolic environment persists even with weight loss (Larson *et al.*, 1995), making the formerly or subsequently obese more prone to accumulate adipose tissue particularly on a high fat diet (Astrup, Buemann, Christensen & Toubro, 1994). This suggests that in certain individuals a low fat diet would be particularly beneficial in preventing further weight gain, achieving weight loss and facilitating weight maintenance.

Inactivity

In contrast to food intake studies, energy expenditure has received comparatively little attention in obesity research despite decreases in activity at a population level (Prentice & Jebb, 1995). Moreover, in conjunction with energy intake energy expenditure largely determines fat oxidisation (Astrup *et al.*, 1996), suggesting an aetiological role for inactivity. The inverse relationship between energy spent on activity and the level of fatness in cross-sectional studies (eg. Schulz & Schoellor, 1994) either suggests decreased energy expenditure proceeds the development of obesity or accompanies it. Prospective studies have linked inactivity with increased obesity and changes in body fat (eg. Ching, Willett, Rimm *et al*, 1996). Substantial fat loss has been reported over a 1-year period with increased exercise and a stable energy intake (Wood, Stefanick, Dreon, Williams & Haskell, 1991). However, in the light of inconsistent findings and the absence of longitudinal analysis it is unclear whether reduced energy expenditure is a cause or consequence of obesity or a marker for other behavioural factors related to body weight such as dietary fat (Dietz, 1996). Nevertheless, from a public health perspective exercise has been shown to enhance the level of weight loss and adherence to treatment as well as having positive health benefits (Powell, Thomson, Caspersen & Kendrick, 1987; Berlin & Colditz, 1990). Patients' activity levels should therefore be assessed and suggestions for building exercise into an inactive lifestyle should be made.

Resting metabolic rate

In contrast to the paupicity of research investigating body weight and inactivity, research has extensively explored the role of energy metabolism in the development and maintenance of obesity. Resting Metabolic Rate (RMR) refers to the energy required

to maintain vital bodily functions including respiration, heart rate and blood pressure and accounts for 60-75% of daily energy expenditure in sedate individuals. However, differences in body composition influences RMR with a higher rate associated with greater fat free mass (Ravussin & Bogardus, 1989). Direct measurements of energy expenditure in obese subjects suggest that metabolic rate is not lower in the obese: instead the obese consistently expend more energy than their lean counterparts with RMR increasing steadily as body weight increases (Prentice *et al.*, 1986). However, if energy expenditure is expressed per unit body weight the energy expenditure of the lean and obese is similar, a finding confirmed by a recent meta-analysis of 319 measurements of total energy expenditure including thermic effect of food (Jebb & Prentice, 1995). Nevertheless, several longitudinal studies have found low rates of energy expenditure predict greater short term weight gain compared with a normal or elevated RMR (eg. Ravussin, Lilloja, Knowler *et al.*, 1988). However, a relationship between resting energy expenditure and long term weight gain (Seidell *et al.*, 1992) or regain (Weinsier, Nelson, Hensrud *et al.*, 1995) has not been established. Since energy expenditure increases with increases in fat free mass, an initial low metabolic rate may lead to weight gain followed by an increase in metabolic rate (Ravussin & Bogardus, 1989), although such a proposition awaits empirical verification. Since no treatments are aimed specifically at changing metabolic rate, vigorous exercise which produces physiological and metabolic perturbations that persist after activity has ceased (Ruderman, Balon, Zorzano *et al.*, 1986) may prove helpful particularly for patients with a history of dieting for whom metabolic rate may be depressed.

1.5.4. GENETICS

More recently, it has been hypothesised that the development of obesity is due to environmental influences in genetically predisposed individuals. Adipose tissue and energy balance each has a genetic basis (Bouchard *et al.*, 1990; Bouchard, 1991; Bouchard & Pérusse, 1993). Body weight, total body fat, body fat patterning (eg. waist hip ratio, fat cell number) and the amount and distribution of fat during periods of weight gain all have a inheritable component. In addition, each of the major elements of the energy balance relationship including resting metabolic rate; the thermic effect of food; changes in energy expenditure in response to overeating; the relative proportion of lipids and carbohydrates oxidised have a genetic basis. The discovery of an obese gene in mice has led to the description of the leptin system (a hormone secreted from adipose tissue), consistent with the concept of a lipostatic set point for weight regulation (Considine, Sinha, Heiman *et al.*, 1996; Bennett, McFarlane-Anderson, Wilks *et al.*, 1997) although its role in the pathogenesis of obesity in humans is unclear (Trayhurn, 1996). However, the existence of the hereditary transmission of obesity does not negate the role of environmental factors in which such genetic susceptibility finds its expression (Sørensen, 1992). Indeed the inverse relationship between obesity and social class provides evidence of potent environmental influences on adiposity (Sobal & Stunkard, 1989). Nevertheless, in assessments of patients for the prevention of further weight gain consideration should be given to patients with a genetic predisposition to obesity (eg. overweight parent, early onset) for whom early intervention may prove particularly useful and for whom losing weight may be more difficult (Colvin & Olson, 1983).

1.6. OBESITY TREATMENT: WEIGHING UP THE OPTIONS

1.6.1. MATCHING TREATMENTS TO PATIENTS

Although the etiology of obesity is important in guiding health professionals' assessment of obese patients, treatment choice is ultimately dictated by the appropriateness of treatment for a particular patients' needs. A variety of weight control treatments are available (Stunkard, 1984; Holmes, Zysow & Delbanco, 1989; Bray, 1992*b*; Brownell & Wadden, 1991, 1992) which can be graded according to the degree of weight loss achievable and the level of health care intervention required (see table 1.1 below). Decisions regarding the type of treatments appropriate for different patients require a 'stepped care' approach by which movement to a higher level of care should be based on a consideration of the following: the goals of treatment (ie. medical, psychosocial); the degree of obesity; the individual needs of the patient (ie. weight profile, treatment preferences) and the degree of weight loss achieved at follow-up (Brownell & Wadden, 1991). Treatment should take account of such negative prognostic factors such as early onset obesity and a history of weight cycling (Smith & Fremouw, 1987). Patients most appropriate for treatment in primary care are those patients with a BMI between 25 and 30 (Clark, Pera, Goldstein *et al.*, 1996). While patients needing to lose more weight (eg. BMI 30 - 40) should be assessed on an individual basis. Patients requiring weight losses of more than 50lbs (BMI > 40) would be more appropriately treated by referral to a specialist clinic (Field & Henderson, 1993). In such cases available treatments include: pharmacological approaches (eg. appetite suppressants, Bray, 1992*b*; Elks, 1996), surgical approaches (eg. Jejunoileal bypass surgery; vertical banded gastroplasty and gastric bypass surgery, Kral, 1992) and

cognitive behavioural therapy (CBT, Hall & Hall, 1982).

Table 1.1: Matching treatments to patients

BMI	Balanced diet	Exercise	Calorie diet [>800 kcal/d]	Low calorie diet [<800 kcal/d]	CBT	Drug therapy	Surgery
20-25.9	1	1	1	3			
25-29.9		1	1	2		3	
30-34.9		2	1-2	1	1	2	
35-39.9		3	2	1	1	2	3
>.40		3	3	1	1	1	1

Table from Bray (1992*a*)

1.6.2. TREATMENTS AIMED AT REDUCING ENERGY INTAKE

Given the treatments available to practice nurses, weight control therapy in primary care is usually confined to dietary changes, increased physical activity and altered eating behaviour. To lose weight at a rate of 0.5-1kg a week requires an energy deficit of 500-1000 kcal/day and is achievable on a diet of 800-1500 kcal/day. Dietary regimes include calorie-and fat- restricted diets as well as promoting healthy eating based on the four food groups (Health Education Authority, 1995*b*). Low-fat diets have been shown to be particularly successful at bringing about weight loss (eg. Sheppard, Kristal & Kushi, 1991). Self-directed efforts including an initial meeting with a practitioner have been shown to produce average loses of up to 7 kg in 6 months (Black, Coe, Friesen & Wurzmann, 1984). For patients with a significant amount of excess weight to lose or who fail to reduce using conservative approaches, a more intensive treatment such as very-low-calorie diets may be required (Bray, 1992*a*) although such approaches should

be used with caution (see 'problems with dieting' below). Very-low-calorie diets (400-800 kcal/d) produce average loses of 15-20 kg in 12 weeks although weight regain is high (Wadden, Foster & Letizia, 1994) and recent research suggests no clinical advantage to using diets that provide <800 kcal/d (Foster, Wadden, Peterson *et al.*, 1992). Other medically supervised approaches include liquid diets; bulking agents that produce a sensation of 'fullness'; enzyme inhibitors that alter digestion or absorption; and fat substitutes, although most have produced disappointing results in clinical studies (Foster *et al.*, 1992).

1.6.3. PROBLEMS WITH 'DIETING'

However, in recent years the use of 'diets' as a means of bringing about calorie restriction has been questioned (Wooley & Wooley, 1984; Gilbert, 1989; Garner & Wooley, 1991; French & Jeffery, 1994; Ogden, 1994). For example, 'dieting' may have negative consequences for psychological well being (eg. increased depression), particularly during the treatment phase and for those with pre-existing psychiatric problems (French & Jeffrey, 1994). Moreover, dietary restraint (Herman & Mack, 1975) is counterproductive, bringing about disinhibited eating (Wardle, 1987; Ogden, 1993) which may contribute to binge eating (Wardle, 1987) and lead to repeated cycles of weight loss and regain (Ogden, 1994). The effects of persistent failed dieting on body weight and composition are not fully known. Research suggests that both restrained eating (Platte, Wurmser, Wade *et al.*, 1996) and weight loss reduces resting metabolic rate (Leibel & Hirsch, 1984; Leibel, Rosenbaum, & Hirsch, 1995) but returns to baseline with subsequent return to normal eating and consequent weight regain (Wadden, Foster, Stunkard & Conill, 1996). This suggests that reduced energy expenditure after weight

loss is a consequence of the reduction in fat free mass that occurs as a consequence a decrease in weight. However, since research has largely been confined to cross-sectional and short term perspective studies, the metabolic effects of persistent weight cycling are unknown. In a review of the consequences of dieting, French and Jeffrey (1994) conclude that dieters in the general population weigh more than non-dieters and that dieting itself may be a risk factor for future weight gain or variability. As a consequence of the potentially negative effects of 'dieting' to lose weight, the use of 'diets' has been discouraged. Therefore, newer treatment approaches aim to minimise negative psychological effects of restrictive dietary regimes in order to maximise the potentially positive psychological sequelae of successful weight loss (Wadden, Stunkard & Liebschutz, 1988).

1.6.4. TREATMENTS AIMED AT INCREASING ENERGY EXPENDITURE

Despite the potential role of energy expenditure in weight gain, very little attention has been paid to weight loss methods that promote energy expenditure. Metabolic stimulants (eg. ephedrine and caffeine) have been found to increase fat loss but not total weight loss relative to a placebo (Elks, 1996). While exercise would appear the obvious solution the energy expended in a single bout of exercise is minimal (Calles-Escandón & Horton, 1992). Weight loss obtained through exercise is difficult to compare with weight loss obtained through other methods because exercisers may preferentially lose adipose tissue and preserve or even increase lean body mass which is heavier (Wood *et al.*, 1991). In a recent meta-analysis of the effects of aerobic exercise on weight loss, Garrow and Summerbell (1995) estimate that exercise without dietary restriction will bring about only modest loss of weight. However, even moderate levels of exercise can

bring about weight loss and prevent slow regain (Wood *et al.*, 1991). Therefore, some form of exercise should be recommended to most overweight patients, ideally (if safety permits) working up to three 20-minute sessions of vigorous activity per week (Field & Henderson, 1993).

1.6.5. PROBLEMS WITH REGAIN

Although, treatment regimes based on dietary modification, calorie restriction and exercise bring about weight losses prospective studies looking at patterns of weight regain in men and women are pessimistic. Results from both commercial weight loss programs and clinical weight loss trials suggest that although dieters do lose weight over time they also tend to regain most of it. Estimates of weight rebound are as high as 95% (Wadden, 1993), although regain may be lower for self-treated dieters without a history of repeated dieting failures (St.Jeor *et al.*, 1993). The rate of regain is higher after a very-low-calorie diet (VLCD) than other more conservative approaches (Wadden *et al.*, 1994). Improved weight maintenance post-treatment has been demonstrated using an ad lib diet (low-fat high-carbohydrate) in comparison to a traditional fixed energy (calorie counted) diet (Toubro & Astrup, 1997). Weight regain continues to increase with increasing time from treatment (Kramer, Jeffrey, Forster & Snell, 1989). Intensive relapse prevention interventions have been shown to increase weight maintenance (Nunn, Newton & Faucher, 1992) but are not a viable option within general practice. Therefore, as a consequence of difficulties inherent in obesity treatment (particularly BMI > 30), newer treatment approaches suggest adopting a 'chronic disease model' as best practice (Wing, 1992). As a chronic disorder obesity requires a continuous care model of treatment involving both a hypocaloric phase with loss of body fat and a longer

term maintenance plan for keeping weight at healthier levels (St Joer *et al.*, 1993).

1.7. CHAPTER CONCLUSIONS

In summation, this chapter has attempted to elucidate the rationale and empirical evidence regarding the assumptions underlying the emphasis on weight management in primary care. Prevention of cardiovascular disease has become a key public health objective. Consequently, attention has focused on the role of obesity management in promoting cardiovascular health within general practice. Legislative and consumer forces have served to define the role of the primary care team in health promotion, with practice nurses positioned at the forefront of delivering preventive services. Although, the treatment of obesity offers the opportunity to bring about significant health gains, since obesity is a heterogeneous disorder with a complex aetiology and a high level of recidivism, uncertainty remains a major barrier to effective treatment. Given the potential negative health consequences of weight variability and 'dieting', serious consideration must be given to the possibility that weight-reduction treatments that confer only transient effects may be hazardous to health. Therefore, health professionals require a proactive but sympathetic and flexible treatment approach accompanied with sustained follow-up. The next chapter will explore the efficacy of obesity management in primary care and the predictors of both patient outcomes and provider treatment decisions.

Chapter 2

PATIENT OUTCOMES AND PROVIDER PRACTICES: UNDERSTANDING TREATMENT DECISIONS AND THE POTENTIAL FOR CHANGE

2.1. OVERVIEW OF CHAPTER

As shown in chapter one, the management of obesity in primary care offers the opportunity to bring about significant health gains. This chapter will explore the efficacy of obesity management in primary care and the potential influence of the health professional in patient outcomes. Through an integration of the potential modifiers of intervention effectiveness administered via general practice, it will be shown that patient outcomes are the product of a process beginning with care provision. To illustrate the potential for improving health professionals' commitment to preventive care, existing research on the provision of obesity services within general practice will be examined. The relationship between current investigations of clinical decision-making and contemporary psychological theory, will be used to emphasise the potential role of health professionals cognitions in explicating variability in provider behaviour. Finally, a critical review of existing empirical research investigating attitudinal predictors of health professionals' obesity management will be provided.

2.2. EFFICACY OF OBESITY MANAGEMENT IN PRIMARY CARE: FAILURE AND ITS EXPLANATION

2.2.1. EFFECTIVENESS

Within primary care evidence for the effectiveness of nurse intervention for weight loss

is limited (see Ebrahim & Smith, 1997 for systematic review). The majority of studies concerned with dietary control have not been administered through general practice due to high attrition rates (Holmes *et al.*, 1989). Most of the literature does not focus exclusively on diet or weight but looks at a number of different lifestyle outcomes including smoking prevalence, alcohol consumption, exercise, diet and weight. A substantial degree of existing research has been conducted exclusively in the context of health checks, the results of which suggest the impact of health checks on weight loss and dietary change are low (Gibbons, Riley & Brimble, 1993; OXCHECK, 1994; Family Heart Study Group, 1994 OXCHECK, 1995; Little & Margetts, 1996). Moreover, evaluations of the effectiveness of both opportunistic (Dowell, Ochera, Hilton *et al.*, 1996) and more intensive health promotion interventions performed by practice nurses have been pessimistic (Roderick, Ruddock, Hunt & Miller, 1997; Baron, Gleason, Crowe & Mann, 1990; Roberts & Roberts, 1998). Slightly better results have been obtained in secondary prevention: health promotion directed at those with known CVD has been shown to increase exercise and improve dietary habits but not to reduce BMI (Cupples & McKnight, 1994). More intensive weight loss studies have been more successful at bringing about weight loss (eg. Meland, Lærum & Ulvik, 1996; Molokhia, 1998) although are uncharacteristic of weight management in primary care. Health promotion programmes while not always achieving behavioural change targets may nevertheless be effective in reducing morbidity (Stamler, Stamler, Gosch *et al.*, 1989).

2.2.2. METHODOLOGICAL MODIFIERS OF WEIGHT LOSS

Several methodological reasons exist for the ineffectiveness of weight management interventions administered through general practice. These include failure to take

account of subpopulations (ie. binge eaters, early onset obesity, and history of weight cycling) for whom the prognosis is poorer (Brownell, 1993; Fitzgibbon *et al.*, 1993). Obesity should not be treated as homogeneous either in therapy or subsequent statistical analysis (Brownell & Wadden, 1991). Moreover, the use of non-standardised treatments with a variable dietary focus makes comparisons of studies problematic and prevents any assessment of the appropriateness of advice. Furthermore, since the likelihood of weight rebound is high, the use of long term follow-ups may confound failed weight loss with failed weight maintenance. For example, OXCHECK (1994) at 1 year follow-up found a reduction of 1.6% in those with a BMI≥30 in the intervention group however by year 3 (1995) earlier gains were not sustained over time. Finally, the contents of interventions are largely atheoretical and largely based on an educative approach to intervention: attempts to change behaviour are focused on trying to alter behaviour directly via attempts to increase patients knowledge regarding which behaviours are appropriate for promoting health. In common with many other health promotion initiatives (see Bunton, Murphy & Bennett, 1991; Stanton, Kim, Golbaith & Parrott, 1996; Abraham, Sheeran & Orbell, 1998; Hardeman, Johnston, Kinmonth & Wareham, 1998 for discussions), few theoretically-sound attempts have been made to alter directly cognitive antecedents of behaviour utilising structured psychological theories of behaviour change for weight management particularly within the context of primary care.

2.2.3. COMPLIANCE AND THE ROLE OF PATIENT COGNITIONS

Apart from potential methodological modifiers of weight management outcomes, current research paradigms implicitly assume a straightforward relationship between

advice (input) and weight loss (outcome): there is a tacit acceptance that if advice is given then patients should lose weight. However, even assuming that advice is given, the potential for weight loss is dependent on many factors including patients following the advice. Although, prerequisites of compliance are patients recall and understanding of advice (Ley, 1988; Ley & Lleweln, 1995) behaviour change is complex. For example, within the medical literature factors such as patient satisfaction has emerged as predictive of adherence to treatment (eg. Woolley, Kane, Hughes & Wright, 1978; Ley, 1982; Bertakis, Roter & Putnam, 1991; Williams, Weinman & Dale, 1998). While within the counselling literature patients' perception of the acceptability of a recommendation (eg. ease of compliance and the extent to which intervention is based on clients strengths) has been used as a conceptual tool for predicting the probability of implementation of counsellor recommendations (Conoley, Conoley, Ivey & Scheel, 1991; Conoley, Padula, Payton & Daniels, 1994).

Research within the health psychology literature has explicitly examined behavioural change using multivariate explanatory models (see chapter three). Most of this research has focused on patients' cognitions including attitudes, values, outcome expectancies, efficacy expectancies, social influences, barriers to change and past behaviour. The results of this extensive research suggest that weight loss and dietary change behaviour is related to motivation (ie. intention to change); attitudes and beliefs (eg. recognition of risk and positive outcome expectancies); social expectations; self-efficacy and past habits, and is confined by barriers to change (eg. household organization and finance) (eg. Schifter & Ajzen, 1985; Shannon, Bagby, Wang & Trenkner, 1990; Bagozzi & Warshaw, 1990; Kelly, Zyanski & Alemagno, 1991; Clark, Abams, Niaura, Eaton &

Rossi, 1991; Conner, Polvey, Bell & Norman, 1994; Sparks, 1994; Sparks, Shepherd, Wieringa & Zimmermanns, 1995; Conner, Martin, Silverdale & Grogan, 1996). Such psychological measures therefore have the potential to moderate the impact of health promotion on patient outcomes. Hence patients' cognitions can be conceptualised as both a target of intervention and a therapeutic end point.

2.2.4. READINESS TO CHANGE

Further, investigations of the relationship between health professionals' advice and patient outcomes, assumes that change is a discrete entity. However, recent insights from the psychological literature suggest change is a process (DiClemente & Prochaska, 1985; Prochaska, DiClemente & Norcross, 1992). DiClemente, Prochaska and their colleagues have identified five overlapping stages that individuals move through when initiating an attempt to modify some aspect of their lifestyle. The earliest stage in the change process is that of precontemplation, followed by contemplation, preparation and finally action. After action the individual may then move into the sixth stage of maintenance or go into relapse. While conceptual and methodological issues exist regarding the application of stage theories in research (Sutton, 1996; 1997*a*; 1998a*b*), the importance of the concept of 'readiness to change' in practice is indicated by research that suggests attempting to impose change may produce resistance (Ockene, Kristeller, Goldberg, Amick *et al.*, 1991) and current theories of persuasion that suggest the importance of motivated reception (Petty & Cacioppo, 1986). However in none of the intervention studies reviewed was patients readiness to change documented (Stott, Kinnersley & Rollnick, 1994). Research suggests that 'stage of change' is an important variable since it influences both the likelihood of participation in health promotion

interventions (McCann, Bovbjerg, Curry, Retzlaff *et al.*, 1996) and the outcomes of such interventions: health promotion interventions are more promising in 'high risk groups' or groups with a pre-existing health problem who may already be contemplators of change (eg. Cupples & McKnight, 1994, Meland *et al.*, 1996). The proposition that change is a process rather than a discrete entity, implies that health professionals' advice should not only be tailored towards the individual but that it should also be tailored towards the stage that the individual is at (eg. precontemplating, contemplator etc) (Rollnick, Kinnersley & Stott, 1993). For example, after health screening pre-comtemplators may move into the contemplation stage but may not be actively changing their behaviour. Therefore, the location of the patient within the change process is a potential modifier of the impact of health promotion advice on patient outcomes (Oldenburg, 1994). Hence the patients current 'stage of change' is an important modifier of patient outcomes and the change process itself can be conceptualised as both a target of intervention and a therapeutic end point.

2.2.5. COMMUNICATION BETWEEN PATIENT AND HEALTH PROFESSIONAL

Within the context of health promotion the process of behavioural change does not occur in isolation but as a result of the interaction between health professional and patient. In recent years there has been growing realisation that patient-provider communication plays a central role in effective medical practice (Simpson, Buckman, Stewart *et al.*, 1991), particularly in the light of research that suggests that positive responses to health professionals' treatment may incorporate a placebo effect (Shepherd & Sartorius, 1989). Where direct observation methods have been employed adjunct to self-report, discrepancies have emerged between perceived and actual communication

both by the patient and the health professional (eg. Wilson, Green, Goldman *et al.*, 1997). For example, both doctors and patients overestimate the extent to which they have discussed important issues such as the patient's ability to follow the treatment plan (Makoul, Arntson & Schofield, 1995). Hence, a considerable amount of research has examined factors related to communication and patient adherence (see Roter, Hall & Katz, 1988 for review). Research suggests health professionals' ability to meet patients' expectations, the types of information the doctor provides to the patient, and the manner in which this information is communicated (eg. patient-centredness and language used) are positively associated with patient satisfaction and compliance (eg. Stewart, 1984; Patterson & Fogarth, 1985; Buller & Buller, 1987; Gibbs, Gibbs & Henrich, 1987; Hall, Roter & Katz, 1988; Bertakis *et al.*, 1991; Ockene *et al.*, 1991; Miller, Benefield & Tonigan, 1993; Williams, Weinman, Dale & Newman, 1995; Williams *et al.*, 1998). Therefore, the health professionals' pedagogic and communicative style is instrumental in patients' decision making processes and resulting health outcomes. Thus, as in psychotherapy the highly psychological nature of health care recasts patient-provider communication as the vehicle of therapeutic change (Balint, 1964; Winefield, 1992). Hence, the communication between patient-provider dyads is an important modifyer of patient outcomes and can be conceptualised as both a target of intervention and a therapeutic end point.

2.2.6. INTERACTION BETWEEN PATIENT AND HEALTH PROFESSIONAL

The relationship between process variables (eg. communication) and patient outcomes is not straightforward. Patients' beliefs and behaviour exist not only in the context of the consultation but also within both the patients' and the health professionals' own

interpretational framework that includes prior belief systems, a dynamic doctor-patient relationship and symptom perception (Sätterlund Larsson, Säliö, & Aronsson, 1987; Henbest & Stewart, 1990; Winefield, Murrell, Clifford & Farmer, 1995; Glover, Gannon, Sherr & Abel, 1996; Michie, Axworthy, Weinman & Marteau, 1996; Gore & Ogden, 1998). Therefore, the process of communication between health professional and patient is affected by the degree to which their two realities are mutually compatible (Mathews, 1983; Helman, 1985). For example, research suggests concordance (agreement) between health professional and patient on the nature of the problem and health beliefs have been shown to promote recovery resulting in 'less dysfunctional' consultations (Bass, Buck, Turner *et al.*, 1986) and to lead to higher levels of patient adherence (Boyer, Lerman, Shipley *et al.*, 1996). Furthermore, practitioner-patient agreement about a variety of medical problems is associated with greater expectations for improvement and with better outcomes as perceived by both patient and professional (Starfield, Wray, Hess *et al.*, 1981; Gillespie & Bradley, 1988). Discordance on basic information such as disease progression (Gamsu & Bradley, 1987) and treatment goals (Marteau, Johnston, Baum & Bloch, 1987) may all contribute to patient-provider miscommunication impeding adherence. Therefore, the outcomes of advice are the product of a reciprocally determined relationship between patient and professional.

2.2.7. HEALTH PROFESSIONALS AS AGENTS OF CHANGE

Since health promotion incorporates intervention prior to the presentation of pathology, the health professionals' role is proactive rather than reactionary. Explicit in the health promotion literature is the view that health professionals should try to target patients beliefs and attempt to establish new behavioural patterns while taking into account

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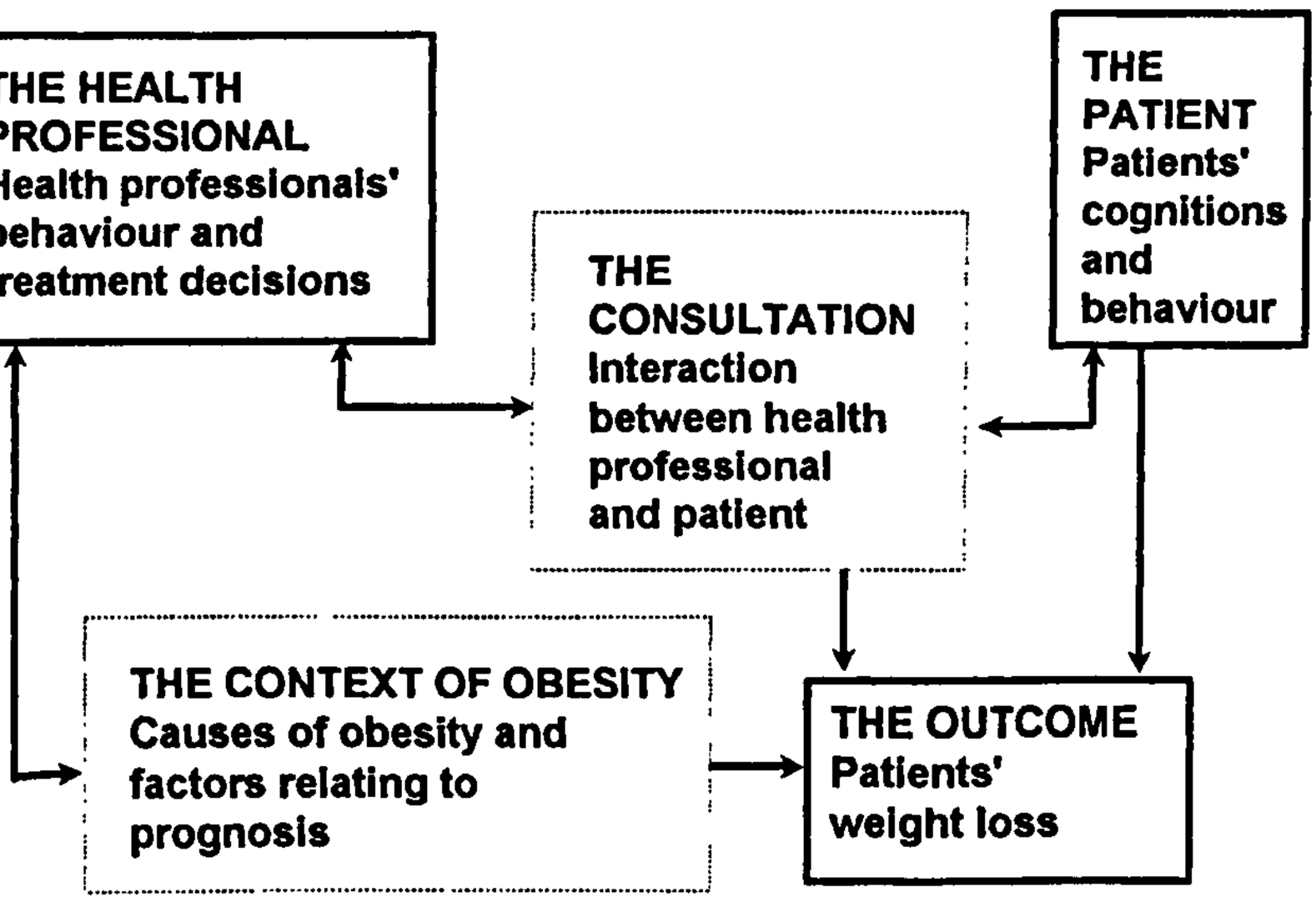
material or social circumstances (Arborelius, 1996). This model of 'appropriate' practice advocated for primary care is based on psychological evidence that suggests that behavioural change is a process (Field & Henderson, 1993). Health professionals can contribute to weight control through motivating patients to begin the process of change; providing information on health risks/benefits; exploring current eating patterns; social circumstances and barriers to change; selecting appropriate treatment according to patients needs and providing regular follow-up care with emphasis on weight maintenance (Clark, *et al.*, 1996). Those who are not ready to change should be provided with the opportunity to weigh up the advantages and disadvantages of changing their behaviour. Therefore, the change process explicitly involves the health care provider through instigating change, through choosing interventions and through communication. Therefore, differences in provider treatment choices and intervention propensity have the potential to impact on patients decisions and behaviour contributing to variability in patient adherence and health outcomes (Marteau, 1989*a*; Marteau, 1989*b*; Marteau & Johnston, 1990; DiMatteo, Sherbourne, Hays *et al.*, 1993).

2.2.8. HEALTH PROFESSIONALS AS OUTCOMES

Therefore, as agents of change health professionals are intrinsically bound up with the change process (see fig 2.1): it is the health professional who has the job of instigating and/or assisting change. The patient may be either receptive or unreceptive, the proposed change may be either acceptable or unacceptable, the patient may or may not comply with the advice. However, only once the health professional has performed their role as agent of change, does the unit of analysis then become the relationship between patient and outcome. Such a view conceptualises 'the health professional as

the drug' (Balint, 1964) and affords health professionals a key role in the behavioural change process. Hence, health professionals' treatment decisions are important modifiers of patient outcomes and as such can be conceptualised as both a target of intervention and a therapeutic end point. Therefore, although the evaluation of weight management outcomes in primary care could be improved via stricter methodologies and the inclusion of patient and process variables as mediators of the advice-outcome relationship, this does not provide an understanding of the mechanisms underlying health professionals' behaviour. However, if the health professional is conceptualised as the unit of change and outcomes are conceived of as the end product of a long process beginning with care provision, one way to improve patient outcomes is to understand the behaviour of the health care provider.

Fig.2.1: Proposed relationship between health professional, patient and patient outcomes



2.3. HEALTH PROFESSIONALS' BEHAVIOUR: VARIABILITY AND ITS EXPLANATION

2.3.1. HEALTH PROFESSIONALS' BEHAVIOUR

An emphasis on the role of the health professional in patient outcomes focuses attention on the health professionals' own behaviour; treatment decisions and service delivery become the first step in understanding the weight management process. Success of intervention in primary care involves not only the provision of appropriate advice but also accurate identification of overweight patients and a commitment to offer care. For the purpose of discussion a distinction was made between health professionals decisions involving the provision of obesity management (ie. diagnostic thresholds and counselling rates) and those involving the process of obesity management (ie. treatment choice and pedagogic style). While the process of care is clearly dependent on the provision of care they are not mutually exclusive: excellent weight management skills are redundant without a commitment to service provision; high commitment to service provision is ineffectual if the subsequent advice is inappropriate.

2.3.2. PROCESS OF WEIGHT CONTROL SERVICES

Choice of treatment

Guidelines for weight control treatments are contained in the Better Living Better Life handbook for General Practice representing one of many such examples. Using an evidenced-based strategy reveals several different approaches to weight control available to the primary care team all of which involve some form of dietary

modification conjunct to exercise (see chapter one). However, although nutritional counselling has been the focus of much recent research (Glanz, 1997), few studies have specifically investigated the content of weight management advice given by the primary care team. In the only UK study specifically to address practice nurses' treatment choices for obesity, the results of interviews conducted in eighteen practices revealed that they encourage healthy eating, discourage crash dieting and emphasise exercise although few set specific exercise targets (Ochera, Hilton, Bland, Dowell & Jones, 1993). Similarly in a survey of GPs obesity treatments, 92% of respondents advised patients to decrease their calorie consumption and 75% advised patients to exercise (Price, Desmond, Krol, Snyder & O'Connell, 1987). Comparable treatment rates were reported in a more recent study of GPs obesity counselling with 75% of respondents recommending eating fewer calories, 78% recommending eating less and 77% offering exercise advice: only 2% of respondents reported recommending very low calorie diets or appetite suppressants (Cade & O'Connell, 1991). While preference for dietary modification and exercise accords with current guidelines, the results suggest consistent variability and a substantial proportion of noncompliant professionals: for example, approximately 25% of respondents reported either only sometimes or rarely advising patients to modify their eating behaviour (Cade & O'Connell, 1991). However, it is unclear the range of treatments considered by practice nurses and whether low users of particular weight control strategies prefer alternative treatments or have low levels of obesity counselling *per se*.

Appropriateness of treatment

Despite the trend towards a healthy eating ethos, investigations of the macro-nutritional

content of advice suggests a tendency for practice nurses and GPs to give 'blanket' nutritional information exhibiting difficulty in tailoring recommendations to individual case vignettes (Kyle, 1993; Francis, Roche, Mant, Jones & Fullard, 1989). However, the extent to which results from analogue studies generalise to clinical practice is unclear. Furthermore, the concepts of appropriateness and quality of care are themselves multifaced with numerous potential indices including comparisons with 'best practice'; reductions in health risk status; weight lost; level of compliance with advice and degree of patient satisfaction. Nevertheless, even when a specific index of appropriateness has been chosen such as 'best practice', appropriateness of advice is difficult to assess since it is dependent not only on patients' needs but is also conditional on patients' own treatment preferences and individual goals. For example, while offering simple healthy eating advice without specific calorie control to a patient who needs to lose more that 50kg would be inappropriate, offering healthy eating advice to a patient who would 'prefer' to count calories would be similarly inappropriate. Therefore, although patients' current weight and amount of weight loss required provide an index of appropriateness, acceptability of a recommendation to individual patients may be a more useful measure of appropriateness particularly if compliance is the outcome criterion. However, no studies have investigated the extent to which primary care health professionals match their obesity treatments to the individual patient.

Delivery of treatment

Although, investigations of the way advice is given in primary care for weight control are sparse, research of health promotion practices generally converges on the suggestion that health professionals' pedagogic activity largely involves giving information using

a provider-centred approach (Russell & Roter, 1993). Similarly within primary care, interviews with doctors and practice nurses suggest that pedagogic activities employed for weight control and lifestyle change generally centre around information giving and recording behaviour, often employing an authoritarian or expert-to-novice interactional style ie. telling patients what to do (Arborelius, Krakau & Bremberg, 1992) despite research suggesting compliance is related to a facilitative style (Patterson & Fogarth, 1985). Information giving is predicated on the assumption that behaviour change is guided by knowledge, a view that as already discussed is untenable in the light of contemporary psychological theory regarding the role of information in behaviour change. Condemnation of patients' behaviour, exhortations to change (Arborelius & Bremberg, 1994) and recommending patients to control their impulses (Thompson, Schwankovsky & Pitts, 1993) have been cited as responses by doctors in the context of health promotion. Pedagogic strategies employing soliciting patients' ideas, understanding the significance of behaviour for the patient and discussions of perceived barriers/benefits are utilised less frequently despite recommendations supporting the adoption of a patient-centred approach within current health promotion literature (Field & Henderson, 1993). However, no studies have specifically explored practice nurses' pedagogic strategies. It is therefore unclear to what extent the current ideology supporting patient-centredness and stage-based motivational counselling is reflected in current weight management practices. Moreover, without the views of patients, patient-centredness (ie. the action of seeking clients opinion about dietary change) may simply carry face value if not followed by client participation in decision making (Tapsall, 1997) or accompanied by positive feedback (Chang, 1994). As Armstrong (1984) points out, patient-centredness does not guarantee what is said is heard. However, no studies

have examined how primary care health care professionals' pedagogic style is interpreted by the individual patient.

2.3.3. PROVISION OF WEIGHT CONTROL SERVICES

Identification of overweight patients

The process of weight management (ie. treatment choice and pedagogic style) is only one aspect of weight management that at a broader level includes health professionals' degree of involvement in service provision. Since health professionals are required to be proactive in weight management, legislative changes now formally require practices to document BMI and give lifestyle advice as 'appropriate' and several guidelines exist. Current recommended guidelines suggest the change process should be initiated if the patient is overweight ie. BMI >24.9 (Field & Henderson, 1993). Patients who seek advice, have CVD, have additional cardiovascular risk factors, have weigh- related comorbidities or a BMI>29.9 should be given the highest priority. Research suggests the identification of patients as overweight is a necessary precondition of follow-up (Kligman, Levin, Senf & Magill, 1988; Heywood, Firman, Sanson-Fisher *et al.*, 1996). Health checks are therefore a crucial event in the identification and documenting of overweight patients. However, examination of patients' experiences of health checks in general practice reveal current health check recommendations are not adhered to. Patients from 18 practices in West Yorkshire, South West London and Surrey revealed wide variation in the content of the reported health checks provided by practice nurses (Ochera, Hilton, Bland, Jones & Dowell, 1994). Overall, only 29% of the sample who reported receiving a health check, actually received a full health check as laid down in

the 1990 GP contact. Only 55% of those known to have had a health check in the preceding 12 months could even recall having one. Although, documentation of BMI is an important first step in the weight management process, both patients (Ochera *et al.*, 1994) and practice nurses (Gaw, Lindsey & Ford, 1996) report documenting rates below 85%. In other areas of preventive medicine health professional noncompliance with guidelines is a frequently documented occurrence (eg. Woo, Woo, Cook, Weisberg & Goldman, 1985; Millstein, Igra & Gans, 1996; Ley, 1981; O'Brien, 1997). However, the extent to which practice nurses utilise current guidelines for the initiation of weight control treatment has not been investigated.

Counselling rates

Not only does research suggest overweight patients are not always identified (ie. BMI is not measured) but even when identified counselling rates are often less than optimal. For example, in a study of 4,941 patients 12.4 % of overweight patients and 42.5% of obese patients reported receiving advice on diet and weight loss from a GP or practice nurse in the previous 12 months (Silagy, Muir, Coulter, Thorogood, Yudkin, & Roe, 1992). Similar counselling rates were obtained in a study looking at the occurrence of preventive care within consultations where advice was given to only 22% of overweight patients (Heywood, Ring, Sanson-Fisher, & Mudge, 1994). In a more recent survey of 230 GPs and 7,161 patients the patient's self-reported risk status (ie. BMI) was matched with the GPs identification of overweight patients and subsequent provision of weight loss advice (Heywood *et al.*, 1996). The results revealed that GPs identified 59% of the overweight patients: of these 36% were given advice, including some with a BMI <25. The low level at which weight management advice is given accords with physicians own

self-reports of dietary counselling in routine medical care (Hiddink *et al.*, 1995). For example, in a sample of 1,103 GPs more than two thirds reported providing dietary counselling to 40% or less of their patients and spending five minutes or less discussing dietary change (Kushner, 1995). Therefore, physician-identified prevalence of obesity is significantly lower than actual population prevalence (eg. McArtor, Iverson, Benken & Dennis, 1992). The low levels of obesity and nutritional counselling revealed by such research concords with other areas of health promotion such as smoking cessation (Fortman, Sallis, Magnus & Farquhar, 1985; Heywood *et al.*, 1994;1996).

2.3.4. THE GAP BETWEEN IDEOLOGY AND PRACTICE

Prior to the GP Contract and the New Health Promotion package numerous studies reported a gap between the ideology of health promotion and its implementation by GPs in day-to-day practice (eg. Wallace *et al.*, 1987, Kligman *et al.*, 1988; Levy & Williamson, 1988; Mant, McKinlay, Fuller, Randall, Fullard & Muir, 1989; Pill, Jones-Elwyn & Stott, 1989). Such a finding may not be surprising given the earlier medicalised ethos and lack of formalised structural support for preventive practice. Research regarding the process of obesity management in primary care (both pre- and post- dating legislative changes) is sparse, particularly in relation to practice nurses. It is therefore unclear to what extent practice nurses comply with current guidelines. The neglect of practice nurses by researchers may reflect past prejudice concerning their earlier more auxiliary role in patient care; a position that is no longer justified given the pivotal role of practice nurses in implementing current health promotion policy (see chapter one). Nevertheless the results of more recent findings regarding the provision of weight management are disappointing given more than a decade of persuasion from

government and public health authorities (Royal College of General Practitioners, 1981; Royal College of Physicians, 1983). Therefore, despite a supportive ethos towards prevention and legislative succour a wide gap may still exist between patients' need for weight management advice (see chapter one) and the availability of advice (Rosser & Lamberts, 1990). This underscores the necessity to improve the delivery of obesity management by the primary care team (Ross *et al.*, 1994, Hibble, 1995; Peter, 1993; Buttrriss, 1997) including the investigation of the precursors to obesity treatment (McArtor *et al.*, 1992). Given the potential for significant improvement in patients health status through early recognition and aggressive management of obesity, the barriers to practice nurses identification and involvement in clinical management of obesity require further explication (McArtor *et al.*, 1992).

2.3.5. VARIABILITY IN HEALTH PROFESSIONALS BEHAVIOUR

Although the research examining practice rates suggest that weight control and nutrition counselling may be less than optimal in primary care, health professionals' counselling rates may vary: some health professionals may be more proactive in their delivery of obesity management than others or more compliant with existing guidelines. Wide interdisciplinary variation has been found in service rates, treatment preference, use of diagnostic thresholds and the adoption of clinical guidelines for a variety of preventive practices (Mullen & Holcomb, 1990; Bisson, MacGillvray, Thomas & Stirrat, 1991; Murray, Narayan, Mitchell & Witte, 1993; Ribacke, 1995; Mannion & Ogden, unpublished manuscript). However, not only has variability been found across disciplines but considerable intradisciplinary variability in health promotion practices within primary care has been documented (Coppel & Davis, 1998). For example, GPs

vary in the rates at which they gather information about diet (Valante, Sobal, Muncie, Levine & Antlitz, 1986); the frequency of which they provide weight management and nutritional counselling and the types of treatments they offer to patients (Thompson *et al.*, 1993; Glanz & Gilboy, 1992). Although, no studies have investigated variability in practice nurses' weight management, practice nurses' decisions regarding physical activity have been shown to vary: differential follow-up procedures are discernable according to whether practice nurses are 'restricted' or 'active' promoters of physical activity (McDowell, McKenna & Naylor, 1997). Moreover, variability in practice nurses' treatment behaviour has been reported in spite of the existence of specific clinical guidelines. For example, practice nurses exhibit disconformity as a group in defining a cutoff point for the initiation of dietary treatment for high cholesterol with within group responses ranging from 5.2 to 6.5 mmol (Ochera *et al.*, 1993). However, intradisciplenary variation in clinical practice is not confined to primary health care staff or health promotion but has been reported across a number of disciplines and clinical problems (eg. Johnston, Bromley; Boothroyd-Brooks *et al.*, 1987; Price, Desmond, Ruppert & Steizer, 1989; Grembowski, Milgrom & Fiset, 1991; Fahey & Peters, 1997). Therefore, treatment choices and low levels of weight management may not be universal: some health professionals may be more proactive than others or more likely to offer a variety of treatments, even within the same professional group.

2.3.6. THEORETICAL FRAMEWORKS APPLIED TO HEALTH PROFESSIONALS

With the recognition that health professionals differ in the extent to which they engage in weight management and adopt clinical guidelines, changing practice requires an understanding of the factors that may produce behavioural variability. However,

research within primary care has mainly been carried out within one of two research paradigms: information processing and behavioural-decision theory (Elstein & Bordage, 1982). Each theoretical perspective has the potential to be used both as a normative tool (to prescribe how decisions should be made) and an analytic framework (to describe how decisions are made). The dialectic among the two approaches can be interpreted by the foci of empirical inquiry. For example, the programmatic focus of the information processing approach as applied to medicine has largely been concerned with characterising the processes involved in problem solving. To this end research has attempted to specify the steps or processes by which information is selected, gathered, integrated, evaluated and combined to reach a diagnosis. The focus of the approach provided by behavioural-decision theory as applied to medicine has largely been concerned with prescribing how decision choices should be made under conditions of uncertainty. Research has attempted to decompose decisions into probability and preference judgements and to provide a set of rules for their combination. Investigation of heuristic biases in judgement processes represents the point with which information processing and decision making perspectives intersect.

2.3.7. LIMITATIONS OF MEDICAL DECISION-MAKING RESEARCH

Research into non-medical influences on medical decision-making has sought to describe behavioural variability according to provider and patient demographic and personal variables (eg. McKinlay, Potter & Feldman, 1996). Although descriptive research reveals systematic variation in weight management (Valante *et al.*, 1986; Price *et al.*, 1987; Bray, York & DeLany, 1992; Silagy *et al.*, 1993; Hiddink *et al.*, 1997; Holund, Thomassen, Boysen *et al.*, 1997), without a theoretical framework such results

provide little perspicacity into provider variability. However, theoretically driven research into medical decision-making has largely been confined to investigating the diagnosis of acute diseases via an examination of hypothesis testing, inferential biases and the prescription of optimal decision strategies (McWhinney, 1972; Elstein & Bordage, 1982; McGuire, 1985; Weinman, 1987). For example, using the hypothetico-deductive method as an organising framework for examining clinical reasoning, research reveals wide variation in the diagnostic processes between doctors (Jones, 1987; Simpson, Rich, Dalgaard *et al.*, 1987). Nevertheless, investigations of variation in diagnostic judgements have largely been confined to atheoretical comparisons of novices and experts in an attempt to identify indicators of 'best' practice despite suggestions that experienced decision-makers utilise elaborated knowledge structures and inferential short cuts (Groen & Patel, 1985; Dumont, 1993).[3] When investigations of variability have been guided by theory, research has focused on describing how practitioners' deviate from normative principles of judgement formation as defined by behavioural-decision theory[4] (eg. Denig, Haaijerruskamp, Wesseling, & Versluis, 1993; Hershberger, Part, Markert *et al.*, 1994) and on the development of decision algorithms to reduce the use of cognitive short cuts (eg. Essex & Healy, 1994). Therefore, the majority of research has concentrated on how clinical judgements are formulated and

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[3] A number of specific heuristic strategies and inference rules have been identified to explain biases in clinical decision-making (McGuire, 1985; López, 1989) and everyday reasoning (Fiske & Taylor, 1991). The majority of research has focused on understanding biases that occur in the formation of probability (Tversky & Kahneman, 1973; Kahneman & Tversky, 1972) and value judgements (Ableson & Levi, 1985) and the effects of framing on decision-making (Marteau, 1989*a*; Kahneman & Tversky, 1984).

[4] The starting point for behavioural-decision theory is subjective expected utility (SEU) which combines judgements regarding the probability of an outcome with judgements of the value of the outcome (Edwards, 1961). With its roots in economics, it is assumed decision makers should choose the behavioural alternative with the highest expected utility (see Ajzen, 1997; Mellers, Schwartz & Cooke, 1998 for reviews). It is not intended as an isomorphic representation of information processing (Frisch & Clemen, 1994).

in doing so has neglected investigation of their consequences or functions as predictors of decisions and behaviour.

2.3.8. LIMITATIONS OF DISEASE KNOWLEDGE

The focus on the process of decision-making (ie. judgement formation) ignores decision outcomes (Hershey & Baron, 1987): variability in the diagnostic process does not necessarily translate into variability in subsequent decisions (McGuire, 1985). Without a theory of behaviour change or an understanding of how process relates to behaviour, such research does not have the potential to explain behavioural variability. Although it is recognised that information is interpreted by reference to an 'extrapolated memorized context' (Gale & Marsden, 1982), knowledge (as opposed to beliefs) is afforded central status (Grant & Marsden, 1987): it is implicitly assumed that doctors hold an objective knowledge set with which they make clinical decisions (Marteau & Johnston, 1990). However, an exclusive focus on disease-based knowledge as a source of variation in clinical practice is insufficient to explain behaviour.

Firstly, many decisions do not allow for objectively defined probabilities and values (Galotti, 1989). In clinical settings knowledge defined as tested, verified and shared is often lacking and can be considered as working hypotheses or beliefs (Marteau & Johnston, 1990; Le Fanu, 1991). For example, even expert opinion is equivocal regarding the impact of weight on health (Steptoe & Wardle, 1994), diet on health (Atrens, 1994) and the aetiology and treatment of obesity (Bray *et al.*, 1992). Given the lack of consensus, health professionals can be viewed as constructing their 'object' by making sense of health and illness using the multiplicity of perspectives culturally

available (Crellin, 1998; Helman, 1978; Paredes, De la Peña, Flores-Guerra, *et al.*, 1996). Secondly, the existence or availability of knowledge in not enough for its translation into behaviour. Knowledge use in response to a stimulus is influenced by both information 'accessibility' and 'salience'. The more accessible or salient information is in memory the more likely it will be activated. Determinants of accessibility and salience include properties of a stimulus, properties of a situation and properties of the perceiver including cognitive and motivational differences (Higgins, 1997). Therefore, health professionals may hold adequate knowledge but this knowledge may not be translated into behaviour (remaining unaccessible or latent).

Finally, information 'in' does not equate with behaviour 'out' without 'black box' intervening variables (Ross, 1991). The 'educational model' in which 'knowledge leads to practice' has been much maligned within the patient literature in favour of insights gained from adult education (eg. Greene, Baudin & Bryan, 1991). A cumulative body of research within the behavioural change literature suggests adequate knowledge and skill provide the necessary but insufficient conditions for action (Richard & van der Plight, 1991; Paredes, et. al., 1996; Wardle, Steptoe, Bellisle *et al.*, 1997; Michie, McDonald & Marteau, 1997). Changing knowledge does not concomitantly lead to changes in behaviour (Glanz & Gilboy, 1992; Kyle, 1993) without the modification of attitudes (Weinberger, Cohen & Mazzuca, 1984; Ross & Rosser, 1989). Therefore, although intensive intervention aimed at improving health professionals nutritional knowledge has increased the frequency of intervention (Lazarus, Wiensier & Boker, 1993), behavioural change may arise as a consequence of changes in cognitions (ie. confidence). As already discussed within the context of patients health-related

behaviours, contemporary psychological theory assumes that behaviour is guided by beliefs. Thus, the beliefs of health care personnel represent a potential target for change in maximising the effectiveness of current health promotion programmes within general practice.

2.3.9. HEALTH PROFESSIONALS' ATTITUDES AND BELIEFS

With the recognition that provider behaviour is not guided by medical knowledge alone, research has begun to explore the relationship between variation in health professionals' beliefs and practices across a number of medical spheres including: management of psychosocial and physical problems (Dale & Middleton, 1990; Kee, Gaffney, Canavan *et al.*, 1995); diabetes care (Marteau & Baum, 1984; Gumsu & Bradley, 1987; Marteau & Kinmouth, 1988; Gillespie & Bradley, 1988; Marteau *et al.*, 1990); dental practice (Grembowski *et al.*, 1991); prescribing behaviour (Brewin, 1984); health promotion (Levine, Wigren, Chapman, *et al.*, 1993; Glanz, Tziraki, Albright & Fernandes, 1995; Coleman & Wilson, 1996; McDowell *et al.*, 1997); sexual health (Ngomuno, Klepp, Rise & Mnyika, 1995; Millstein, 1996); screening practices (Clasen, Vernon, Mullen & Jackson, 1994; Brown, Bauman, Helberg *et al.*,1996); pain management (Nash, Edwards, & Nebauer, 1993); documenting practices (Renfroe, O'Sullivan & McGee, 1990); autopsy practices (Bunce & Birdi, 1998); home care provision (Vermette & Godin, 1996) and helping behaviour in psychiatric illness (Sharrock, Day, Qazi & Brewin, 1990; Conning & Rowland, 1992). The results of this developing literature suggest that health professionals' beliefs can be used to understand variability in provider behaviour and provides a potential means for future intervention. Since this thesis is concerned with practice nurses weight control, the rest of this review will be

confined to an explication of existing research regarding health professionals' beliefs about obesity and its management.

2.4. HEALTH PROFESSIONALS' ATTITUDES AND BELIEFS ABOUT OBESITY AND ITS MANAGEMENT: EMPIRICAL RESEARCH

The question of which cognitions are important in predicting patients behaviour has been the focus of much research within health psychology and a variety of theoretical models have been developed which will be discussed in chapter three (see Gochman, 1988; Conner & Norman, 1996*a*; Stroebe & Stroebe, 1995 for overviews). Nevertheless, two broad categories of beliefs can be distinguished. Beliefs which focus on behaviour and its outcomes and those concerned with beliefs about disease. This distinction will be used to organise the remainder of this chapter.

2.4.1. BELIEFS ABOUT OBESITY

Attributions of causation and control over illness

Research investigating the beliefs of primary care personnel regarding the causes of obesity and attributions of responsibility for bringing about weight loss are sparse. The research to date reveals that GPs often consider obesity a problem largely caused by patients lack of will power (Thomson *et al.*, 1993) or lack of self-control (Price *et al.*, 1987) with hereditary being implicated for only a minority of overweight patients (Thomson *et al.*, 1993). This suggests that GPs consider obesity as an internally caused but potentially controllable health problem that could then serve to increase the

frequency of intervention. Nevertheless health professionals appear pessimistic regarding the extent to which weight gain is permanent: only 6% of pediatricians agreed that obese children can achieve weight loss and only 15% that weight loss can be maintained (Price *et al.*, 1989). Such a conceptualisation may therefore serve to decrease the likelihood of intervention. However, only one study has attempted to relate the attributions made by primary care staff to indices of behaviour. Thomson *et al.*, (1993) report that GPs' beliefs about the causes of obesity were largely unrelated to both propensity to counsel patients about weight loss and the strategies used to motivate patients to change. However, since this study used a narrow range of potential causes of obesity (four) drawing any definitive conclusions is difficult.

Consequences of obesity

Investigations of the perceived consequences of obesity by primary care staff are sparse. Research suggests that the majority of GPs (74%) consider obesity plays an important role in causing morbidity and mortality from chronic disease (Kligman *et al.*, 1988). Nevertheless, considerable variability exists in the degree to which obesity is viewed as a risk factor for specific diseases. For example, in a survey of 318 general practitioners 88% of the doctors considered obesity a major risk for coronary heart disease, 85% osteoarthritis, 96% for diabetes and 48% for colon cancer (Price *et al.*, 1987). Consequently, most GPs consider eating a balanced diet and avoiding excess calories is important for promoting health (Valente et. al., 1986). Overall the results suggest that GPs are aware of the relationship between obesity and morbidity and the opportunity to achieve substantial benefits through weight management. Therefore, an understanding of the risks posed to health of excess weight may serve to increase the likelihood of

intervention. However, although Mullen and Holcomb (1990) found that health professionals' with high expectations for risk reduction following health promotion advice were more likely to report counselling patients about diet/weight loss, no studies have attempted to correlate any measure of risks to health or disease severity and aspects of weight management behaviour.

2.4.2. BELIEFS ABOUT OBESITY MANAGEMENT

Attitudes and beliefs towards prevention

Within the area of weight management the relationship between positive attitudes and behaviour is less clear. Research suggests GPs hold positive attitudes regarding the importance of dietary and weight loss advice (Levine *et al.*, 1993; Kushner, 1995), view health risk counselling as part of their role as health care provider (Kligman *et al.*, 1988; Cade & O'Connell, 1991; Valente et. al. 1996) and afford nutrition counselling a high priority (Kusher, 1995). Nevertheless, few GPs (26%) find weight counselling rewarding (Cade & O'Connell, 1991). In the few studies that have attempted to relate health professionals' beliefs about health promotion to indices of behaviour, results have been pessimistic. For example, Heywood *et al* (1996) found that attitudinal factors relating to prevention (eg. importance of identification) were unimportant in explaining total variance in either identification of overweight patients or counselling for overweight. The authors interpret the results as 'attitudinal factors are unimportant' in explaining the total variance compared with patient and consultation variables. Similarly Solberg, Brekke & Kotte (1997) and Kushner (1995) found little association between attitudes towards preventive services and rates of care provision. Using three

aggregate attitude measures (desire to improve health promotion services, support for organizational change and leadership support) Solberg *et al.* (1997) report 6/48 correlations were significant at <.05. Therefore, despite positive attitudes towards prevention including patient desire for intervention the authors conclude that 'there is little evidence that positive attitudes are translated into behaviour'. However, the reported disparity between beliefs and behaviour may arise as a consequence of using general attitudes to try to predict specific behaviours, a situation that is at odds with contemporary attitudinal theory (see chapter three for discussion). Ajzen and Timko (1986) have shown that specific health behaviours are largely unrelated to general attitudes towards medical services and health practices in contrast to specific attitudes towards a particular behaviour. Within the health professional literature research suggests that more specific and reliable beliefs correlate with specific behaviours: multi-item measures of the effectiveness and applicability of different strategies for providing nutrition education were positively associated with GPs' implementation of nutrition education (Hiddink *et al.*, 1997).

Self-efficacy and perceived success

Several studies suggest that GPs consider weight management difficult, lack confidence that they can counsel patients to lose weight and are pessimistic about their likelihood of success (Price *et al.*, 1987; Kligman *et al.*, 1988; Cade & O'Connell, 1991; Kushner, 1995). This suggests that although physicians appreciate the importance of advice they may lack the confidence to implement such advice. Since GPs believe patients appreciate advice (Hulscher, van Drenth, Mokkink *et al.*, 1997), low confidence may reflect either low perceived skills (Kushner, 1995; Holund, 1997) or high perceived

barriers (Kushner, 1995; Hulsher *et al.*, 1997; Pratt, Nosiri & Pratt, 1997; Solberg *et al.*, 1997). Alternatively, low ratings of confidence may in part reflect the pessimistic assessment of patients' response to advice: 71% of GPs believed noncompliance was a major barrier to giving weight loss advice (Kushner, 1995). However, high levels of self-efficacy are compatible with pessimistic ratings of outcomes (Mullen & Holcomb, 1990) representing a separation of patient outcomes from provider responsibility. Therefore, even when perceptions of confidence are high, perceptions of outcomes may still be low. For example, Valente *et al* (1986) found most doctors felt prepared (90%) to counsel patients about weight loss but only 5% considered themselves currently very successful in changing patients behaviours. Insights gained from the patient literature suggests self-efficacy would have the greater impact on behaviour than outcome expectancies (Bandura, 1989; Schwarzer & Fuchs, 1996). Accordingly, research suggests that self-efficacy is positively associated with weight management and dietary counselling (Price *et al.*, 1987; Mullen & Holcomb, 1990; Thomson *et al.*, 1993; Glanz *et al.*, 1995) in the majority of studies (see Hulscher *et al.*, 1997 for an exception).

2.4.3. CRITIQUE OF CURRENT RESEARCH

Since existing research is sparse having largely been focused on the clinical behaviours of GPs, identification of the main cognitive antecedents of practice nurses' weight control services is difficult. Extrapolation from one health professional group to another may be problematic particularly since practice nurses tend to hold more positive attitude towards health promotion than GPs (Le Touze & Calnan, 1996). Furthermore, the disparate measures of both attitudes and behaviour currently employed make cross comparisons between studies problematic. Nevertheless, what does appear to emerge

is that seemingly positive attitudes of health care personnel are not necessarily translated into behaviour. Several authors have interpreted null results as indicating that attitudes are insufficient determinants of action in comparison to broader influences and constraints (eg. Hulscher *et al.*, 1997). However, the existence of several methodological and theoretical caveats suggest that such a conclusion is premature. Firstly, attention has not been paid to the reliability and validity of measures used. Over reliance on single item measures undermines reliability with the potential to deflate correlations. The only consistent positive association to emerge from the research to date suggests high self-efficacy increases counselling frequency. However, it is unclear whether this is a result of the superiority of self-efficacy as a construct or low levels of method variance: self-efficacy is the only variable to be measured and operationalised consistently. Methodologically the mixture of self-report and items drawn from audit or patient accounts increases the likelihood of method variance: since reliability between various data collecting methods is unknown, discordance on the validity of behavioural items for example cannot be precluded as a potential explanation of null results. Therefore, inconsistencies in the operalisation of variables do not allow the data to be used as accurate indicators of attitudes. Since little parity exists across studies regarding the operationalisation of constructs (including behaviour), assumptions of equivalence cannot be made. Hence existing investigations cannot be interpreted as a cumulative body of research.

Secondly, most research has been largely exploratory lacking a theoretical framework and relying on summary statistics with limited reporting of tests of association between variables. Few studies have used structured models. Hence, choice of attitudinal

predictors has often been guided by intuition rather than theoretical considerations. Researchers have often used general attitudinal measures to try to predict specific behaviours despite insights gained from contemporary psychological theory. Without some theory of the process of change survey research is only useful at the level of offering preliminary information. Without a theoretical foundation for understanding interrelationships among variables explanations are reduced to the status of post-hoc rationalisations. The over-reliance on cross-sectional designs serves further to undermine interpretations of cause and effect. Therefore, while each study makes recommendations for intervention based on its findings, the lack of a common theoretical foundation for the research undermines the power of any such conclusions. However, as already discussed using structured behavioural decision models, attitudes have emerged as important predictors of patients behaviour in a variety of health-related domains. Moreover, research within other areas of medicine including health promotion (eg. Coleman & Wilson, 1996; McDowell *et al.*, 1997; Millstein, 1996; Vermette & Godin, 1996) which have employed theoretical frameworks have suggested that attitudes are important antecedents of future action. Since there is no reason to suspect that health professionals' weight management represents a special case of behaviour, and thus no theoretical reason for the observed disparity between beliefs and preventive practice, methodological reasons cannot be ruled out as a reason for the low observed impact of beliefs on weight management practice.

2.5. CHAPTER CONCLUSIONS

Despite the potential for the prevention and treatment of obesity, weight management outcomes in primary care are low underscoring the need for a fuller explication of the

weight management process. Current research paradigms utilised to investigate the effectiveness of interventions in primary care implicitly assume a straightforward relationship between input (advice) and outcomes (weight loss). However, behavioural change is not a discrete entity but can instead be conceptualised as the product of a long process beginning with care provision. An emphasis on care provision focuses on the role of the health professional in patient outcomes: treatment decisions and service delivery become the first step in understanding the weight management process. Investigations of the available evidence suggest weight management counselling in primary care is less than optimal. The existence of substantial systematic variability in clinical behaviour underscores the necessity for a full explication of provider decisions. However, the focus of research into medical decision-making has concentrated on a narrow set of specific decision making processes. Since, the assumption that health professionals' follow normative decisional rules guided by objective knowledge of disease is no longer tenable in the light of contemporary psychological theory, research has begun to focus on the cognitive predictors of clinical behaviour. However, empirical research investigating the beliefs and behaviours of the primary care team regarding obesity management are lacking, particularly in relation to practice nurses despite their primary role in delivering weight control services. Interpretation of existing investigations are further rendered problematic as a consequence of methodological caveats and the absence of theoretically driven research. It is therefore unclear as to the most likely predictors of health professionals' weight management behaviours. The next chapter will explore the variety of theoretical models that have been successfully utilised in the study of patients' health-related behaviour, to develop an analytic framework from which to investigate the practices of health professionals.

Chapter 3

COGNITIVE PREDICTORS OF BEHAVIOUR: A CONCEPTUAL INTEGRATION OF SELF-RELATED AND DISEASE-RELATED BELIEFS

3.1. OVERVIEW OF CHAPTER

As shown in chapter two the beliefs of health care personnel have the potential to be used to understand and predict clinical practice. However, to date research investigating the cognitive predictors of practice nurses' obesity management have been sparse, largely descriptive and atheoretical in perspective. In contrast, a systematic body of research has developed around understanding the cognitive antecedents of patients' health-related behaviours. Consequently, a variety of behavioural decision models have been developed and applied in the patient health domain. This chapter aims to provide a conceptual integration of the main theoretical models currently utilised to explain and predict the actions of patients with the explicit aim of identifying potential antecedents of health professionals' behaviour. Thematically, the extent to which each model provides unique proximal predictors of behavioural-decisions will be examined and the degree to which evidence supports the hypothesised effects of individual constructs will be discussed. The final part of this chapter will consider how the theories may be integrated to provide a comprehensive model for investigating the behaviour of health professionals.

3.2. ASSUMPTIONS OF SOCIAL COGNITION MODELS

The question of which cognitions are important in predicting patients behaviour has

been the focus of much research within health psychology and a variety of theoretical models have been developed (Conner & Norman, 1996*a*; Gochman, 1988; Stroebe & Stroebe, 1995). Such models are collectively known as social cognition models (SCMs) since they are primarily concerned with the role of socially-shared knowledge ie. social cognitions[5] in the self-regulation of behaviour (Fiske & Taylor, 1991; Conner & Norman, 1996*b*). However, while united in attempting to explicate the cognitive antecedents of behaviour, SCMs differ regarding the content, relative importance and hypothesised belief-behaviour link. Nevertheless, two broad categories of SCMs can be distinguished. Expectancy-value models (Ajzen, 1997) which focus on future expectancies consequent on action and attribution models which are mainly concerned with the causal explanations of past events or behaviour (Anderson, Krull & Weiner, 1997).

However, underlying all SCMs are several theoretical propositions that while beyond the scope of this thesis are nevertheless inherent in the theoretical perspective adopted herein (Abraham & Hampson, 1996; Conner & Norman, 1996*b*; Kippax & Crawford, 1993). First, it is assumed that decision-makers are 'rational' to the extent that their beliefs and behaviours form an internally coherent and logically consistent set and behaviour is consistent with their goals, expectations and values. However, no assumptions are made that beliefs are veridical. Second, it is assumed that behavioural decisions are based on reasoned deliberative processing of the available information

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[5] Social cognitions are assumed to incorporate affective tendencies via the conative component of attitudes (Eagly & Chaiken, 1993). Therefore, the role of emotions, mood states and affective reactions has largely been omitted from current social cognition research (see Loomes & Sugden, 1982; Isen, Rosenzweig & Young, 1991; Bagozzi, 1992; Forgas, 1995; Weiner, 1985 for theoretical developments).

(Fazio, 1990).[6] However, no assumptions are made that the models themselves reflect judgement formation isomorphically. Third, demographic, sociopsychological and structural variables are assumed to be exogenous to attitudinal antecedents of behaviour exerting their effects indirectly via belief-based measures (although this is not always born out in empirical tests, eg. Chen & Land, 1990; Abraham, Sheeran, Abrams & Spears, 1996).

Fourth, although a unidirectional relationship is postulated between beliefs and behaviour (ie. behaviour depends on beliefs), it is recognised that action and cognition exhibit reciprocal causality (Bentler & Speckart, 1981; Chen & Land, 1990; Weinstein & Nicolich, 1993; Gerrard, Gibbons, Benthin & Hessling, 1996) with several SCMs incorporating recursive elements. Therefore, causality, can only be determined via experimental manipulation. Fifth, it is assumed that an individual's level of motivation and behaviour is based on what they believe to be true (subjective evaluations) and social behaviour is best understood as a function of this cognitive representation of reality (rather than an 'objective' description). Social cognitions are themselves considered enduring characteristics that can be accessed via self reports and are constructed and modified through learning. Therefore, it is accepted that theory-driven categorizations of self reports provide a basis for inferences regarding these stable cognitive representations providing a potential route for intervention. Although, such a proposition rests on the validity of assuming equality of interpretation of responses

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[6] However, it is recognised that under a variety of circumstances automatic processing may occur (Fazio, 1990) and several dual processing models have been espoused which incorporate automatic processing alongside the deliberative processing channels (see the elaboration likelihood model, Petty & Cacioppo, 1986; theheuristic-systematic model, Chaiken, 1980 and the MODE, Fazio, 1990).

which depends upon the degree of cultural homogeneity, it is recognised that the existence of subcultures may result in differences in cognitive structures or relationships (Abraham & Sheeran, 1997). Finally, this thesis in line with previous research takes its primary goal as an investigation of the motivational phase of decision making,[7] in particular the action consequences of beliefs, as the first line of investigation. However, it is recognised that within this paradigm, the factors involved in belief formation and the volitional or action phase of decision making remains under explored (Bagozzi, 1992). Therefore, despite the static nature of empirical applications of SCMs, this thesis assumes that as theoretical representations of decision-making, SCMs are compatible with a dynamic conceptualisation of the decision process (see discussion of stage models below).

3.3. SELECTING SOCIAL COGNITION MODELS FOR REVIEW

Although a variety of behavioural-decision models exist, this chapter will concentrate on discussing the following five SCMs: social cognitive theory (Bandura, 1977, SCT); the health belief model (Becker, Heaffner, Kasl *et al*, 1977, HBM), the theories of reasoned action/planned behaviour (Fishbein & Ajzen, 1975, TRA; Ajzen, 1991, TPB); the attributional theory of helping behaviour (Weiner, 1985, ATHB); and the self-regulatory model (Leventhal, Nerenz, & Steel, 1984; SRM). Model choice was governed by the following considerations: the models (i) provide a broad array of constructs that have the potential to be functionally distinct; (ii) reflect current research

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[7] A distinction can be made between the motivational or decisional stage of the self-regulation of behaviour and the volitional or planning stage (Bagozzi, 1992; Gollwitzer, 1993). The motivational or decision phase involves deliberation of incentives and expectations in order to choose between goals and actions and ends in a decision to pursue a goal. The volitional or action stage involves planning and action towards actual goal achievement (Gollwitzer, 1993; Bagozzi, 1992; Schwarzer, 1992*a*).

endeavours within health psychology (see Rutter & Quine, 1994; Conner & Norman, 1996*a*; Baum, Newman, Weinman, West & McManus, 1997); (iii) have received substantial empirical support within the patient health-behaviour arena; and (iv) can be considered general models of health-relevant behaviour thereby providing the potential to explain and predict health professionals' decisions. Therefore, although widely used subjective expected utility theory (SEU) will not be discussed since the constructs contained in SEU can be subsumed under the TPB (Weinstein, 1993).[8] Similarly, protection motivation theory (Maddux & Rogers, 1983, PMT) will not be discussed since it can be considered a hybrid model in which three components originate from the HBM (vulnerability, severity and response efficacy) and the fourth (self-efficacy) from SCT (Weinstein, 1993; Boer & Seydel, 1996). Moreover, Triandis' (1977) attitude-behaviour model will not be discussed since recent extensions to the TPB (ie. anticipated regret, personal norm and past behaviour) make the two models largely indistinguishable (Valois, Desharnais & Godin, 1988). Finally, the theory of trying and the health action process approach both offer additional conceptual approaches to behavioural prediction: the former while based on the TPB, conceptualises and operationalises motivation and behaviour in terms of effort (Bagozzi & Warshw, 1990), the latter combines the motivational phase from SCT with an explicit action phase (Schwarzer, 1992*a*; Schwarzer & Fuchs, 1996). However, since neither model has been extensively applied nor evaluated they will not be discussed further.

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[8] However, it should be noted that although conceptually similar SEU differs from the TPB in terms of computational formulation and measurement of available alternatives: SEU compares the expectancy-values of performance and non-performance while the TPB like most other expectancy-value models utilises evaluations of behavioural performance only (Ajzen, 1997).

3.4. THE ROLE OF STAGE MODELS

In selecting decision-making models for review consideration was given to recent stage models (eg. transtheoretical model of change, DiClemente & Prochaska, 1985; the precaution adoption process, Weinstein, 1988; and the health action processing approach,[9] Schwarzer, 1992*a*). Most behavioural-decision theories treat the prediction of action likelihood as a continuum on which individuals differ quantitatively. In contrast stage theories view action likelihood as comprising of qualitatively distinct but temporally ordered categories (Weinstein, Rothman & Sutton, 1998). Although, several studies have provided some empirical support for the existence of stage-relevant beliefs (eg. DiClemente, Prochaska, Fairhurst *et al.*, 1991; Weinstein & Sandman, 1982; Prochaska, Velicer, Rossi *et al.*, 1994), numerous conceptual, methodological and operalisational problems have been identified which precludes rejection of continuum models (Budd & Rollnick, 1996; Sutton, 1996; 1997a; 1998*ab*; Weinstein *et al.*, 1998). Behaviour can be considered along a number of dimensions including habitual or nonhabitual; repetitive or one-time; initiating or stopping: different dimensions therefore may have different predictive value depending on the type of behaviour under consideration (Kirscht, 1988). From a practical point of view, the activity of weight management can be considered an ongoing routine (but complex) behaviour involving many decisions with no definite or obvious reason for change. Since most health professionals provide some form of obesity management individual differences in practice can be considered in terms of differences in degrees of involvement. Therefore

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[9] The health action process approach (Schwarzer, 1992*a*, HAPA) differs from other stage models which view motivation and action as but one of several stages. Instead the HAPA combines the motivational stage of SCT with an additional action stage comprising of behavioural plans and contingencies. The action stage mediates between intentions and behaviour (Schwarzer, 1992*a*; Schwarzer & Fuchs, 1996).

it seems reasonable to suppose that most practice nurses can be characterised as within a 'maintenance phase'. Stage models therefore do not provide a means with which to classify increases or decreases in action or effort within a particular stage (eg. maintenance) beyond that provided by current SCMs. Although stage models provide a promising avenue of research for exploring behavioural change, since this thesis is concerned with understanding the antecedents to health professionals current decisions, stage models were not included in this review.

3.5. AN OVERVIEW OF THE MAIN DECISION-MAKING MODELS

3.5.1. SOCIAL COGNITIVE THEORY (SCT)

3.5.1.1. DESCRIPTION OF MODEL & DEFINITION OF CONSTRUCTS

According to SCT behaviour depends on two main types of expectancies: self-efficacy expectancies and outcome expectancies (Bandura, 1977; 1986; 1993, see fig. 3.1). While outcome expectancies refer to the possible consequences of action or inaction (see below), self-efficacy expectancies pertain to the belief in personal action control. Bandura variously defines self-efficacy as a person's 'belief about their capabilities to exercise control over their own level of functioning and over events that affect their lives' (Bandura, 1993, p. 118); as 'a judgement of ones capability to accomplish a certain level of performance' (Bandura, 1986, p. 391) or as 'the conviction that one can successfully execute the behaviour required to produce the outcomes' (Bandura, 1977, p. 193). Such a conceptualisation firmly positions self-efficacy as an individual's estimate of their ability to perform a specific action conditional on internal capabilities

and external resources, opportunities and barriers. However, evaluations are self-referent in that they explicitly refer to performance capabilities as opposed to ratings of task difficulty, although in estimating confidence in performance capability individuals are likely to consider task constraints. Since self-efficacy is considered task specific (as opposed to a general disposition) it is generally operationalised using either global ratings of the degree of confidence over behavioural performance (eg. Wulfert & Wan, 1993) or a series of smaller behavioural tasks graded by level of complexity (Johnston, Wright & Weinman, 1996). Regardless of measurement strategy chosen it is assumed that high self-efficacious beliefs determine motivation and effort and hence behaviour. However, even if self-efficacy is high, an individual may be unlikely to perform an action in the absence of behavioural incentives.

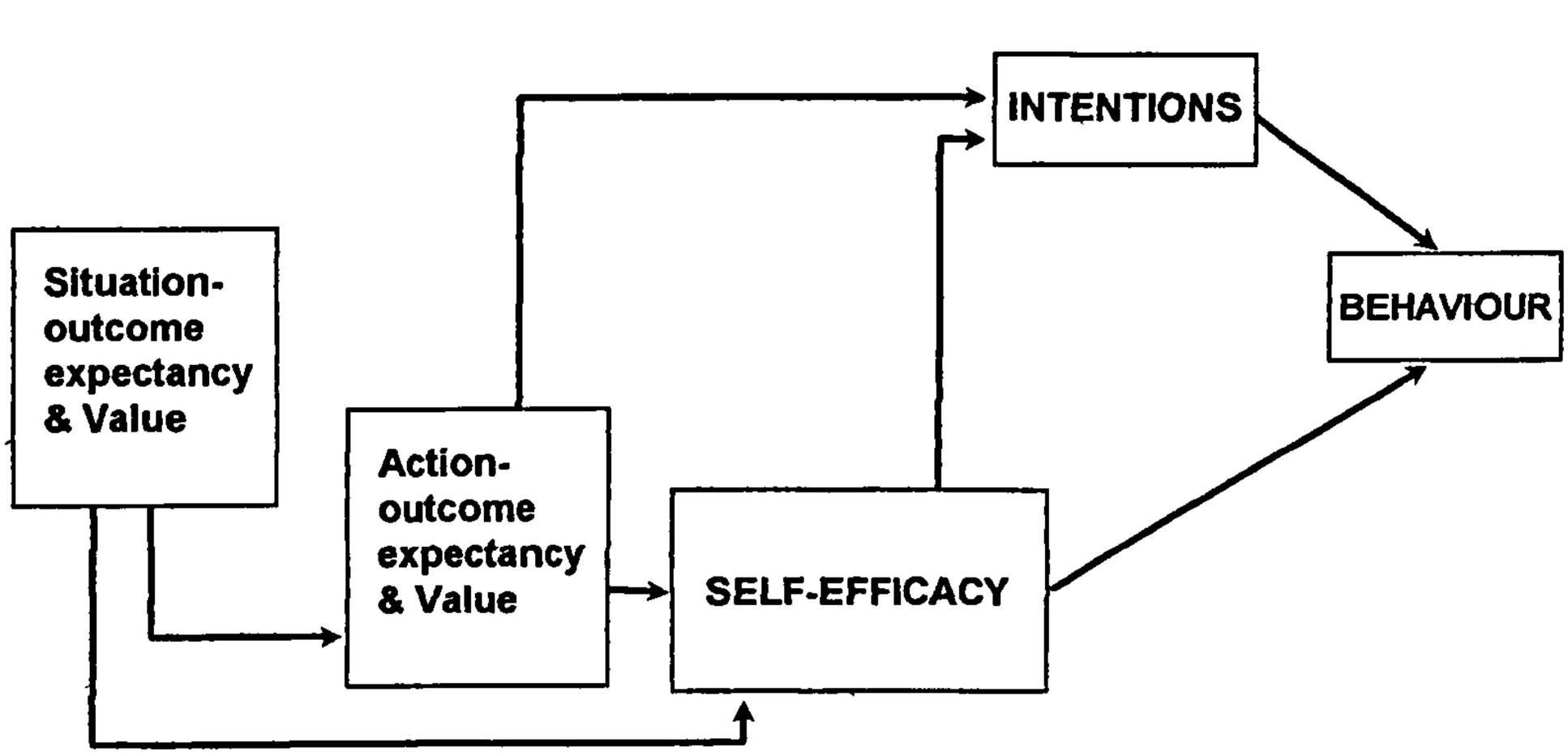

Fig. 3.1: Social Cognitive Theory (SCT)

In SCT behavioural incentives to act are provided by outcome expectancies. Outcome

expectancies are defined as 'a judgement of the likely consequence of behaviour' (Bandura, 1986, p. 391) or as 'a person's estimate that a given behaviour will lead to certain outcomes' (Bandura, 1977, p.193). According to Bandura (1982) outcome expectancies partly reflect in part the belief that the 'punitiveness of the environment' will render a person's behavioural efforts unsuccessful (p. 140), presumably because outcomes will not be achieved even in the face of high levels of personal effort. However, since both self-efficacy and outcome expectancy implicitly involve estimates of success, problems have been reported in maintaining the conceptual distinction between the two constructs (Teasdale, 1978; Manning & Wright, 1983; Sexton, Tuckman & Crehan, 1992). Although self-efficacy implicitly includes some degree of evaluation of outcomes, outcome expectancies are the 'consequence' of an act and are therefore distinct from response-efficacy or judgements of the 'effectiveness' of a technique to produce an outcome (Bandura, 1986).

Two types of outcome expectancies are discernable: action-outcome expectancies and situation-outcome expectancies both of which are operationalised using ratings that are dependent on behavioural performance. Action-outcome expectancies refer to expectancies in which outcomes occur as a consequence of personal action (eg. perceived likelihood of hunger if trying to diet). In contrast, situation-outcome expectancies refer to outcomes that occur as a consequence of inaction or the environment (eg. perceived vulnerability to heart disease given current weight). The more likely an action will lead to desirable consequences (and inaction to undesirable consequences), the greater the incentive and hence the greater the likelihood of behavioural performance. However, the motivational power of individual outcome

expectancies will vary according to the reinforcement value or importance placed on the anticipated outcome by the individual (Teasdale, 1978; Maddux, Norton & Stoltenberg, 1986). Recent applications of SCT weight outcome expectancies by their respective outcome values (eg. Rodgers & Brawley, 1996), a procedure consistent with other expectancy-value formulations (Weinstein, 1993).

Therefore, according to SCT, future expectancies have a substantial impact on action control: individuals are likely to choose to perform an action that requires effort if they believe that they can perform the action and expect that it will lead to positive consequences or a minimization of negative ones (Bandura, 1986). However, since even the strongest intentions may be thwarted by circumstances beyond an individual's control, Bandura (1986) includes a measure of intention or desire to carry out the action. An intention is defined as 'the determination to perform certain activities or to bring about certain future states of affairs' (Bandura, 1986, p. 467). Intentions to act therefore mediate between optimistic self-beliefs supportive of action and situational constraints preventing behavioural performance.

3.5.1.2. COMPUTATIONAL RULES & CHRONOLOGICAL PROXIMITY

Since SCT is founded on an expectancy-value formulation, as already discussed, to be theoretically consistent outcome expectancy should be weighted by outcome value as it cannot be assumed that all outcomes are equally motivating for all individuals.[10]

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[10] The rationale behind using expectancy-value products is the expectation that only those with high incentives which they also value are likely to act. Theoretically self-efficacy could be weighted by 'value' but it is tacitly accepted that it would be highly unlikely for an individual to not value their own competence.

However, in practice outcome value is often omitted from research or included as an independent variable in its own right, thus clearly violating the rational for its inclusion (Manning & Wright, 1983; Maddux *et al.*, 1986; Sexton *et al.*, 1992). In predicting behaviour self-efficacy and outcome expectancy are assumed to combine additively and no special formula has been advocated. However, self-efficacy and outcome expectancy are not equally likely to have a direct independent effect on future behaviour. Instead, the two types of expectancies are hypothesised to have differential functional and motivational consequences for behavioural decision-making.

Self-efficacious beliefs are hypothesised to influence behaviour directly and via their impact on motivation and effort. Action-outcome expectancies are assumed to influence behaviour via their impact on intentions and self-efficacy (Bandura, 1992). While situation-outcome expectancies are assumed to operate as distal determinants of action and to influence behaviour principally via their impact on action-outcome expectancies (Schwarzer, 1992*a*). Outcome expectancies are therefore assumed to operate anticipatorily by alerting self-appraisals of capabilities and perceptions of task demands. Hence, self-efficacy implicitly includes some degree of evaluation of outcomes. However, according to Bandura (1992) the predictive ability of self-efficacy and outcome expectancies are contingent on the role of performance quality in goal pursuit. In activities where outcomes are highly contingent on ability (eg. sport), self-efficacy is hypothesized to account for most of the variance in action control. In contrast a separation of performance quality from the behavioural goal (eg. winning at gambling) leads to a greater independence of outcome expectancies and self-efficacy and increases the likelihood of incentives independently predicting behaviour.

3.5.1.3. EVALUATION

Social cognitive theory has been successfully applied in numerous but diverse areas of patient self-regulation and experimental evidence exists causally linking self-efficacious beliefs to behaviour (see Bandura, 1982; O'Leary, 1990; Schwarzer, 1992*ab*; Bandura, 1992; Schwarzer & Fuchs, 1996; Mischel, Cantor & Feldman, 1997 for reviews). In accordance with predictions research generally suggests that while only self-efficacy is likely to influence behaviour (eg. Dzewaltowski, 1989), both action-outcome expectancies and self-efficacy expectancies independently influence motivation or intention (eg. Brubaker & Wickersahm, 1990; Terry, 1993; Rodgers & Brawley, 1996). However, the role of situation-outcome expectancies has been less clear. According to SCT the effects of situation-outcome expectancies on motivation and behaviour are hypothesised to be mediated by self-efficacy and action-outcome expectancies. However, research has found independent effects of situation-outcome expectancies (eg. perceived susceptibility) on both intentions and behaviour (eg. Seydel, Taal & Wiegman, 1990; Boyd & Wandersman, 1991). Although, it is theoretically possible to argue that the independent effects of outcome expectancies derive from the separation of behavioural goals from performance quality, it is plausible that situation-outcome expectancies involving a high degree of seriousness given inaction (the two studies cited above explored condom use and cancer screening behaviour) may have greater predictive power than situation-outcome expectancies for which consequences for the individual are less catastrophic. Alternatively, inconsistencies regarding the effects of outcomes expectancies may be a product of the less stringent operalisation and application of the construct in comparison to self-efficacy.

However, regardless of current evaluations SCT as a specific theory of decision-making, is no longer considered necessarily distinct from other SCMs (Schwarzer & Fuchs, 1996). Both the main constructs outcome expectancies and self-efficacy have been incorporated into most decision-making models including the theory of planned behaviour and the health belief model (see discussion below). Therefore, given the generally robust findings for self-efficacy and to a lesser extent outcome expectancy as precursors of behaviour, can health professionals' behavioural decisions be adequately predicted from these two sets of cognitions as hypothesised by SCT? In other words are self-efficacy and outcome expectancy as operationalised and defined within the context of SCT the only proximal predictors of self-regulation?

3.5.2. THE HEALTH BELIEF MODEL (HBM)

3.5.2.1. DESCRIPTION OF MODEL & DEFINITION OF CONSTRUCTS

According to the HBM a readiness to act arises from an evaluation of the health threat (severity and susceptibility) and an evaluation of the behaviour in terms of a cost-benefit analysis of action (Rosenstock, 1974; Becker *et al.*, 1977; Janz & Becker, 1984, see fig. 3.2).[11] The evaluation of behaviour comprises of perceived benefits of taking action in terms of the expected positive outcomes of performance and estimates of the costs of action in terms of potential negative consequences or barriers to performance. The

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[11] In addition to susceptibility, seriousness, benefits and barriers, the HBM also proposes an additional variable in terms of a cue to action (Rosenstock, 1974). However, the precise relationship between beliefs, behaviour and action cues was never developed. Moreover, some versions of the health belief model include a fifth cognitive variable, that of 'health motivation' which is defined as 'a general readiness to be concerned about health matters or the degree of value of health to the individual' (Rosenthal, Hall & Moore, 1992). However, health motivation has rarely been examined empirically (Harrison, Mullen & Green, 1992).

evaluation of a health threat comprises of estimate of future vulnerability or susceptibility to illness given inaction and perceptions of severity in terms of the expected seriousness of illness or negative consequences associated with the disease. Modifications of the original variable list have included adding non-disease motivators such as Bandura's self-efficacy construct and behavioural intentions as moderators of action (eg. Rosenstock, Stretcher & Becker, 1988).

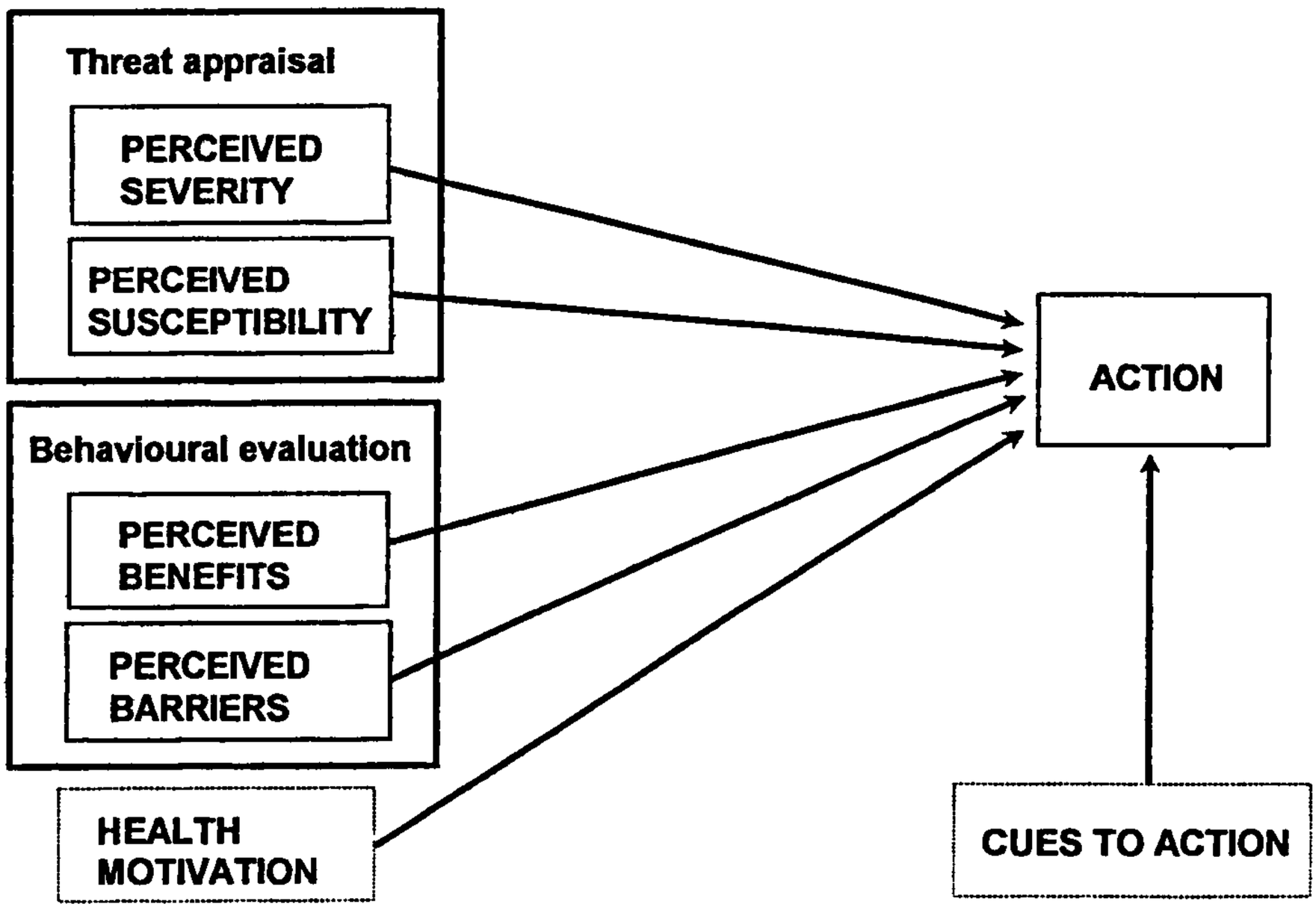

Fig. 3.2 The Health Belief Model (HBM)

3.5.2.2. COMBINATIONAL RULES & CHRONOLOGICAL PROXIMITY

In its original formulation the HBM proposes that 'the combined levels of susceptibility and severity provide the energy or force to act and the perception of benefits (less barriers) provide a preferred path of action' (Rosenstock, 1974, p. 332). Hence, the threat component was originally calculated as the multiplicative function of the summed susceptibility beliefs and the summed severity beliefs; behavioural evaluation was

originally calculated as the sum of benefits minus the sum of barriers. However, although theoretically such a computational formula is in keeping with expectancy-value models, research has not been supportive. In particular tests of the multiplicative formula for threat expectancies have not resulted in superior predictive ability compared with a simple linear additive model (Maddux & Rogers, 1983; Hill, Gardener & Rassaby, 1985; Ronis & Harel, 1989; Ronis, 1992). Therefore, in the majority of applications simple sums of susceptibility, severity, costs and benefits are employed as separate independent variables without loss of predictive power (eg. Murray & McMillan, 1993; Wulfert, Wan & Backus, 1996; Bish, Sutton & Golombok, 1998). More recent formulations have explicitly suggested a threshold hypothesis in which a heightened state of severity is required before susceptibility motivates intentions; once severity reaches a certain magnitude it no longer function as an independent predictor of behaviour (Stretcher & Rosenstock, 1997). This requires an equation in which threat = susceptibility + (susceptibility x severity) but differentiates between individuals with low levels of susceptibility but high perceptions of severity and those with high levels of susceptibility but low levels of severity. [12] Nevertheless, the paths between variables remain unspecified (Wallston & Wallston, 1984).

3.5.2.3. EVALUATION

Although, originally developed as a disease avoidance model, the range of applications

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[12] If an individual has a low level of susceptibility (score of 1) but perceives disease to be serious (score of 7), using a additive rule leads to a score of 8, using a multiplicative rule leads to a score of 7 and using a mixture (adding susceptibility to the susceptibility-severity product) leads to a score of 8. However, if an individual has a high level of susceptibility (score of 7) but perceives disease to be innocuous (score of 1), using an additive rule leads to a score of 8, using a multiplicative rule leads to a score of 7 and using a mixture (adding susceptibility to the susceptibility-severity product) leads to a score of 14.

of the HBM has been diverse and has included both prevention and sick role behaviours (see Janz & Becker, 1984; Harrison *et al.*, 1992; Zimmerman & Vernberg, 1994 for meta-analysis'; and Sheeran & Abraham, 1996 for a review). The results of Janz and Beckers' (1984) meta-analysis revealed that overall the dimensions of the HBM accounted for between 10% and 34% of the variance in behaviour. Perceived susceptibility emerged as having the greatest predictive power regarding preventive health-behaviour, followed in descending order by benefits, barriers and finally severity. Severity was found to only produce significant results in about a third of all studies investigating preventive behaviours possibly because of the remoteness of the majority of health consequences (Janz & Becker, 1984). More recently, Harrison *et al.* (1992) report average correlations that although significant are substantively smaller than those found by Janz and Becker, probably because of the differential inclusion criteria adopted by the two research groups: the maximum that each individual HBM variable contributed to behavioural prediction was reported as less than 10%. Across all health-related behaviours (screening, risk reduction and adherence), the average reported R^2 were as follows: severity (.01); susceptibility (.02), benefits (.02) and costs (.04). More recently Zimmerman and Vernberg (1994) found the 'combined' HBM variables accounted for 24% of the variance in behaviour.

In applications of the HBM researchers have rarely found support for the complete model. For example, reported behaviour has been predicted by none of the original four HBM variables (eg. Kelly *et al.*, 1991; Abraham *et al.*, 1996; Bish *et al.*, 1998); by only susceptibility and benefits (eg. King, 1982); by only the behavioural evaluation components of benefits and barriers (eg. Hill *et al.*, 1985; Warwick, Terry & Gallois,

1993); by only the perceived barrier's dimension (eg. Murray & McMillan, 1993; Wulfert *et al.*, 1996), or by only the threat dimension (eg. Taal, Seydel & Wiegman, 1990). The threat dimension in particular has emerged as a poor predictor of behaviours with results sometimes being contra to predictions (ie. threat negatively related to behaviour) (eg. Taal *et al.*, 1990; Steptoe & Wardle, 1992).

Despite, the wide spread application of the HBM, much early research was cross-sectional and limited by operalisational heterogeneity of key variables and the use of unstandardised combinational rules making assessment of null results problematic (Johnston, 1994; Stretcher & Rosenstock, 1997). In particular a number of methodological explanations have been espoused to explain the poor predictive power of the threat dimension (van der Plight, 1998). First, judgements of threat may be inherently problematic. For example, probability and risk judgements are notoriously difficult to estimate being open to a number of biases and heuristics (Kahneman & Tversky, 1972; Tversky & Kahneman, 1973; Weinstein, 1987). Moreover, as a consequence of the type of behaviours under consideration ceiling effects may occur rendering severity as a predictor of preventive behaviour associated with life threatening disease problematic (Aspinwell, Kement, Taylor *et al.*, 1991). Although it should be noted that the problem of a restrictive range is not confined to the severity dimension but has also been found for beliefs about benefits of prevention (eg. Wulfert *et al.*,1996) and may reflect operalisational difficulties with scale construction rather than a conceptual problem with the HBM model itself.

Second, largely as a consequence of a lack of definitional clarity in the original

formulation, operalisation of the threat dimension has varied considerably providing another potential source of inconsistency. Seriousness has been treated as a multidimensional construct and operationally defined combining both the medical severity of a disease and the psychosocial consequences (Sheeran & Abraham, 1996). For example, seriousness has been variously operationalised using ratings of the functional consequences of illness (King, 1982); emotional response such as worry and anxiety towards the disease (Murray & McMillan, 1993; Orbell, Crombie & Johnston, 1996); as well as global ratings of the seriousness or noxiousness of the threat (Hill *et al.*, 1985); estimates of the chances of survival (Wulfert *et al.*,1996) and comparative ratings of disease seriousness (Seydel *et al.*, 1990). However, despite measurement heterogeneity, functionally all operalisations of the seriousness construct capture aspects of the undesirability or disutility of illness that is in keeping with the original concept. More problematic in terms of interpretation of results, is the observation that the measures of susceptibly and severity are often uncontingent on action thus confounding beliefs with past risk behaviour (Schwarzer, 1994; van der Plight, 1996; 1998).

Finally, since it is argued that threat provides only a readiness to act an individual exhibiting high levels of susceptibility and severity will not be expected to accept any recommendation unless it was also perceived as efficacious. Therefore, negative evaluations of a given behaviour may act as an impediment to performance despite a high degree of hazard perception. Such a conceptualisation implies that perceived threat is a necessary but not sufficient condition for action and suggests that the threat dimension should be considered a more proximal predictor of behaviour akin to situation-outcome expectancies (Schwarzer 1992*a*).

Nevertheless, since health professionals are explicitly trained to think about health care decisions using a disease model, the HBM items are likely to map easily onto providers existing medicalised vocabulary. However, the centralised role afforded threat perception as the force or initiator of action seems limited for understanding behaviour for which personal health gains are not a factor. For health professionals' making decisions regarding patient care other motivational impetuses such as perceptions of patients needs and desires may be more paramount in regulating action. Since the best predictors of intentions and behaviour are the evaluations of the behaviour dimension (ie. benefits and barriers) which essentially correspond to outcome expectancies under the SCT, the HBM would not appear to provide a better predictor of behaviour, particularly since intentions and self-efficacy were not part of the original model. Nevertheless, although SCT also includes a threat dimension under situation-outcome expectancies alongside other situational expectancies, the inclusion of the representation of illness severity and disease consequences as a separate dimension distinct from other situation-outcome expectancies seems a useful theoretical distinction.

3.5.3. THEORIES OF REASONED ACTION AND PLANNED BEHAVIOUR

3.5.3.1. DESCRIPTION OF MODELS & CONSTRUCTS

The theory of reasoned action (TRA)

According to the TRA the causal antecedents of behaviour are a hierarchically organised sequence of cognitions (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975, see fig. 3.3). Since motivation proceeds action, it is proposed that the most proximal determinant of

behaviour is the intention to perform it. Intentions are defined as 'a motivation, effort or willingness to try to act' and operationalised in terms of a conscious plan to exert effort (Ajzen, 1988, p. 113). It is assumed that intentions remain behavioural dispositions until at the appropriate time and opportunity an attempt is made to translate the intention into action. According to the TRA the immediate determinants of intention are attitudes towards the behaviour and the extent of perceived normative pressure to perform the behaviour (subjective norm). Attitudes are defined as a 'psychological tendency and expressed by evaluating a particular entity with some degree of favour or disfavour' (Eagly & Chaiken, 1993, p.1), or a 'general evaluation and overall feeling of favourableness or unfavourableness' (Ajzen & Fishbein, 1980, p.55) and are generally operationalised using semantic differentials. [13] Subjective norms are defined as 'the perceived social pressure to perform the behaviour' and are operationalised in terms of expectations of others regarding whether or not the action should be undertaken (Ajzen, 1988, p. 117; 1991, p. 188). Therefore, according to the TRA intention mediates between the attitudinal measures and behaviour. The model further proposes that attitudes are a function of beliefs concerning the consequences or outcomes of performing the behaviour (behavioural beliefs), weighted by the value placed on each of the consequences (outcome evaluations). Similarly, subjective norms are a function of perceived pressure from key referents (normative beliefs), weighted by the motivation to comply with each referent.

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[13] Semantic differentials refer to a set of evaluative scales which are anchored with diametrically opposed statements such as good *vs* bad, pleasant *vs* unpleasant.

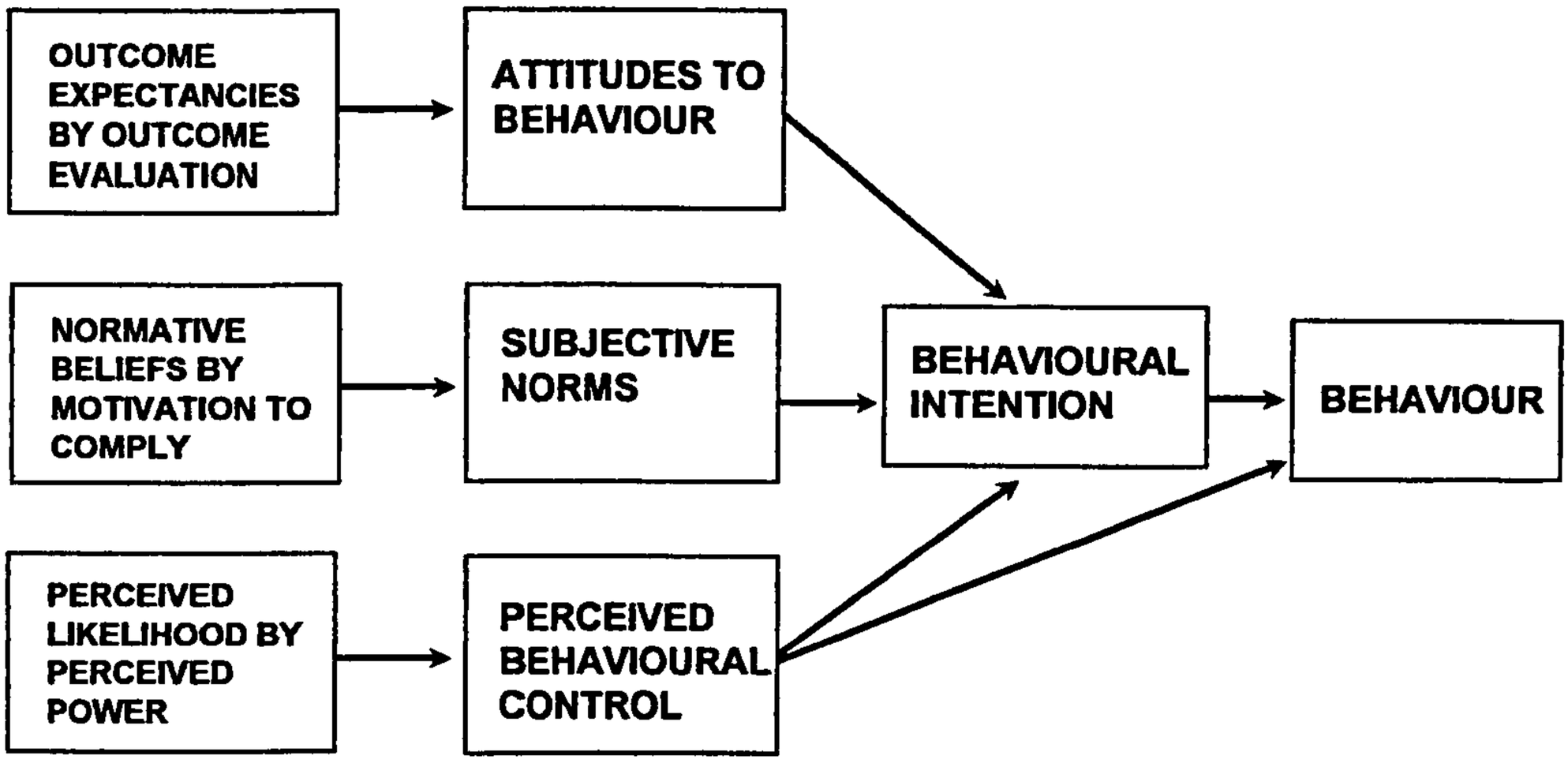

Fig. 3.3: Theories of Reasoned Action and Planned Behaviour (TRA/TPB)

The theory of planned behaviour (TPB)

However, it is hypothesised that the extent to which behaviour is under volitional control attenuates the relationship between intentions and behavioural performance (Ajzen, 1987, 1988; 1991; Ajzen & Madden, 1986). For example, obesity management could be considered a behaviour that is not completely under practice nurses volitional control. Factors that may weaken the intention-action relationship include lack of skills, patient motivation and lack of opportunity (no overweight patients available). The TPB was specifically developed as an extension to the TRA in an attempt to provide a conceptual framework to address involutional behaviour for which intentions may not be sufficient to translate motivation into behaviour and includes a third variable that of perceived behavioural control (PBC) (Schifter & Ajzen, 1985; Ajzen & Madden, 1986; Ajzen, 1988; 1991, see fig. 3.3). In an ideal world to accurately predict behaviour which is impeded by a lack of volitional control requires an accurate estimate of the various

barriers to action. However, since assessments of actual controllability are difficult to obtain, Ajzen recommends utilising PBC as a 'proxy measure of actual control' (1988, p. 133). Perceived behavioural control is generally operationally defined as the 'perceived ease or difficulty of performing the behaviour' (Ajzen, 1988, p.132). As such PBC is assumed to reflect both 'external factors' such as availability of time and the cooperation of others plus internal factors such as competence and ability (Ajzen & Timko, 1986, p. 262). According to Ajzen (1991) underlying the direct measure of PBC are control beliefs which capture the presence or absence of facilitating or inhibiting factors multiplied by an assessment of the power of each item to influence behavioural performance. Therefore, PBC and the accompanying belief-based measures assess perceptions of how much control an individual thinks they have over whether they perform the behaviour or not as well as their assessments of how easy or difficult it will be for them to do so (Ajzen & Madden, 1986; Madden, Ellen & Ajzen, 1992).

3.5.3.3. COMPUTATIONAL RULES & CHRONOLOGICAL PROXIMITY

Under the TRA, the direct measures of attitudes and subjective norms influence behaviour via their impact on intentions. Similarly, the belief-based measures are hypothesised to influence intentions via their impact on the direct measures. In line with expectancy-value principles the TRA/TPB uses a multiplicative formula to combine the belief-based items. However, although under the TRA intentions are assumed to be the most proximal predictor of behaviour, two versions of the TPB were formulated (Ajzen & Madden, 1986). In line with the TRA, the first version proposes that the effects of PBC (like attitudes and subjective norms) will influence behaviour indirectly via intentions. Therefore, in addition to attitudes and subjective norms as

proposed in the TRA, the TPB positions PBC as an additional conceptually independent determinant of intentions. This formulation is based on the assumption that if the individual doubts the extent to which any given behaviour is controllable then motivation to perform the behaviour in question will be low. Therefore, the effect of PBC on actual behaviour is assumed to be indirect via intentions. However, in the second version of the TPB, it is proposed that PBC will have not only an indirect effect on behaviour (via intentions) but will attenuate behaviour directly. Ajzen (1988; 1991) maintains that the path from PBC to intentions is based on the premise that PBC has motivational implications for intentions in the sense that an intention is expected to form in regard to an action only when the person believes they can perform the action. In contrast, the path from PBC to behaviour is anticipated when PBC can be considered to correspond to or function as a partial substitute for actual control over factors that could interfere with performance (Ajzen, 1987; Ajzen & Madden, 1986).

Therefore, the proposed direct effect of PBC on actual performance is based on the assumption that self-regulation is dependent not only on the extent to which the person is motivated to act (intentional component) but also on the extent to which the behaviour is accurately assessed as controllable. Furthermore, Ajzen and Madden (1986) acknowledge the possibility that the effects of PBC on motivation and action may be interactive rather than additive. For instance, when predicting actual behaviour it is possible that the effects of intentions are strongest under conditions of high perceived control. Hence, high scores on measures of both PBC and behavioural intentions may be necessary preconditions for the behaviour to occur. Therefore, PBC may only affect behaviour directly if it realistically reflects actual levels of control, an

accuracy which may emerge over time as a consequence of past experience (Ajzen & Madden, 1986), the implication being that PBC may interact with previous performance levels.

An augmented theory of planned behaviour

Several variables have been suggested as possible extensions to the TPB. More specifically research has suggested that self-identity, anticipated affective reactions and measures of behavioural habit (past behaviour) be included. For example, empirical support has been found for the inclusion of anticipated emotional reactions such as anticipated regret for behavioural non-performance in relation to condom usage (Richard & van der Plight, 1991; Richard, van der Plight & de Vries, 1995). Similarly, self-identity labels have emerged as important predictors of decisions and behaviours in other areas of attitude research (Biddle, Bank & Slavings, 1987; Charng, Piliavin & Callero, 1988; Sparks & Shepherd, 1992). Although, the TPB hypothesises that the effects of past behaviour will be fully mediated by cognitions, a substantial body of research provides evidence to the contrary: several studies have shown past behaviour to have an independent effect (ie effects that are not mediated) on both intentions and future behaviour (eg. Bentler & Speckart, 1981; Valois *et al.*, 1988; Bagozzi & Kimmel, 1995). Recent reviews of research exploring such variables have suggested the results of empirical research corroborate their inclusion as supplementary explanatory constructs (Conner & Sparks, 1996; Conner & Armitage, 1998). However, while the addition of both anticipated regret and self-identity are not in contravention of the TPB (Fishbein, 1993) the addition of past behaviour (habit) as an independent predictor of future behaviour is more problematic. Ajzen (1991) explicitly views the effects of past

performance as a test of the sufficiency of the TPB. Hence, if experience explains additional variance in action the TPB is not an adequate representation of self-regulation (Sutton, 1994). Nevertheless, the inclusion of anticipated regret, self-identity and habit in an augmented TPB brings it closer to Triandis' (1977) attitude-behaviour model (Valois *et al.*, 1988).

3.5.3.4. EVALUATION

The theories of reasoned action and planned behaviour have been applied to a wide range of behaviours (see Ajzen, 1991; Terry, Gallois & McCamish, 1993; Zimmerman & Vernberg, 1994; Conner & Sparks, 1996; Norman & Conner, 1996 for reviews). The results of several meta-analyses suggest the correlations between intentions and behaviour to be reasonable. For example, Ajzen (1988) reports correlations between intentions and behaviour ranging from .72 to .96. Average intention-behaviour correlations obtained by more recent meta-analysis have been lower ranging from .45 (Randall & Wolff, 1994); .46 (Godin & Kok, 1996) to .53 (Sheppard, Hartwick & Warshaw, 1988) but are based on a wider range of studies. Typically intentions correlate stronger with behaviour than attitudes or subjective norms supporting its proposed role as the most proximal determinant of action. However, although the role of attitudes in predicting intentions has generally been corroborated by research, the subjective norm component has received inconsistent support in applied settings (eg. Pender & Pender, 1986; Hill, *et al.*, 1985; Wulfert *et al.*, 1996). Generally PBC has been found to add significantly to the prediction of behavioural decisions (Brubaker & Wickersham, 1990; Ajzen, 1991; Netemeyer, Burton & Johnston, 1991; Godin, Valois & Lapage, 1993; Wankle, Mummery, Stephens & Craig, 1994; Terry & O'Leary, 1995;

Trafimow & Duran, 1998) although there have been exceptions (Chan & Fishbein, 1993; Fishbein & Stasson, 1990; Bagozzi & Kimmel, 1995; Norman & Conner, 1996; Trafimow & Duran, 1998). The results accord with earlier research suggesting the predictive power of the TRA could be improved with the addition of a measure of self-efficacy (eg. de Vries, Dijkstra & Kuhlman, 1988). Differential results may be either a consequence of high PBC (in which case the TPB reverts to the earlier TRA); a consequence of the dual focus of the PBC construct (Terry & O'Leary, 1995; see discussion below); or potential problems with the intention-attitude/subjective norm relationships (Chan & Fishbein, 1993).

Further, despite the specificity with which Ajzen and Fishbein have operationally defined the constructs contained within their model, the specific relations among the variables nevertheless remain unspecified pathways. It is therefore unclear under what circumstances personal determinants of actions (ie. attitudes) will be better predictors of behaviour than perceptions of social approval. Moreover, while the PBC construct is hypothesised to add to the prediction of behaviour only under circumstances of low volitional control, few behaviours can be considered completely volitional (Ajzen, 1988). Therefore, in the absence of specific hypothesis regarding the boundary conditions for the PBC construct, null results can merely be explained by reference to high behavioural control. The initial impetus for the addition of the PBC construct was derived from the persistent finding that past behaviour added to the prediction of future behaviour over and above intentions. Past behaviour was assumed to predict future behaviour because it contained information about barriers to action. Therefore, as already discussed Ajzen (1991) regards any additional effects of past behaviour on

intentions or future behaviour a consequence of shared method variance. However, in a recent review of the evidence Conner and Armitage (1998) report that after controlling for the TPB variables (including PBC), past behaviour added a mean 7.2% of the explained variance in intentions and 13.0% in behaviour. Indeed the average past behaviour-PBC correlation was only moderate ($r = .36$) with an average R^2 of 13.0% suggesting prior experience may contain information not captured by PBC.

Since the TRA/TPB was developed to predict all types of behavioural performance (and not confined to health-related behaviour) they have been extensively applied and elaborated. The TRA/TPB, unlike the HBM emphasises beliefs about behaviour rather than focusing on hazard reduction and is therefore similar in its main emphasis to SCT. The fundamental question raised by the difference in the main perspective of the various models is the extent to which hazard reduction can be considered the primary reason for action. Research derived from the patient literature suggests that many health related behaviours (eg. weight loss, condom use) appear to be governed by a much wider array of motives than threat reduction. According to Weinstein (1993) the importance of motives other than risk reduction in any particular instance can be understood in terms of the improvements in accuracy that can be achieved by adding non-risk variables. With regard to the present thesis, practice nurses' reasons for service provision are even more likely to contain broader motivators than threat perception since outcomes of behaviour have no impact on health professionals own individual health status. Therefore, the focus of the TPB on action-specific cognitions shifts attention away from the general representation of illness as contained under the HBM to the representation of particular treatment behaviours. Functionally, the constructs of the HBM can be

subsumed under behavioural beliefs regardless of differential operalisation and combinational procedures (Weinstein, 1993; Conner & Norman, 1994; Norman & Conner, 1996*b*). For example, since perceptions of threat (susceptibility, severity) under the HBM are made contingent on behaviour, then there is no reason why they should not be subsumed under the TPB like costs and benefits (Weinstein, 1993).

3.5.4. ATTRIBUTION THEORY OF HELPING BEHAVIOUR (ATHB)

3.5.4.1. DESCRIPTION OF MODEL AND CONSTRUCTS

In contrast to the SCMs reviewed so far which focus on beliefs about future events, Weiner's (1980;1985) model of social reasoning accentuates the role of causal explanations of past events as antecedents of future expectancies. Based on achievement motivation principles (Weiner, 1980) that deal with the functional consequences of attributions of success or failure,[14] the ATHB hypothesises that action is a direct function of two independent predictors of helping: the cognitive expectation that help will be successful and the degree of sympathy aroused (Weiner, 1985, see fig. 3.4). Perceived success may include expectancies about the likelihood that the situation can be changed (eg. an outcome expectancy) and beliefs about ones ability to influence change (eg. self-efficacy). Emotional responses may include both pity and anger. Underlying these cognitive expectancies and emotional reactions are a set of causal beliefs. According to Weiner (1980) each attributional belief differs along a number of

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[14] Weiner's (1980) attributional system deals with categorising different types of explanations and their functional impact on behaviour (ie. the attribution-consequence link). This can be contrasted with Kelley's attributional system which deals with the determinants of behavioural explanations or the antecedent-attribution link which will not be discussed (see Kelly & Michela, 1980 for a review of research and King, 1982 for a conceptual integration of the two approaches.

dimensions including the locus or origin of causality (internal *vs* external); the degree of stability of the cause over time (static *vs* variable); and the degree of controllability over the cause (nonvolitional *vs* volitional). Regardless of the locus of causality, the degree of perceived controllability (and in particular the extent of stability) has been identified as the most basic dimension of causality (Weiner, 1980;1985). More specifically, when outcomes (such as performance or illness) are attributed to stable causes, perceivers derive the expectancy that similar outcomes will occur in the future (Weiner, 1985). In general attributing a problem to an external, unstable but controllable cause is the primary determinant of the expectation that help will be successful and hence increasing the likelihood of intervention (Ickes & Kidd, 1976; Brickman, Rabinowitz, Karuza *et al.*, 1982). In other words 'adaptive' attributions are those that are internal, unstable but controllable (Kok, Den Boer, de Vries *et al.*, 1992).

Attributions of controllability and stability are not confined to describing the causes of an event (eg. weight gain) but may also include beliefs about coping behaviour in the form of attributions of control over outcomes (eg. patients' attempts at weight loss). Therefore, both responsibility for the origins of a problem (perceived onset controllability) and its solution or maintenance (perceived coping efforts) are hypothesised to be important when examining helping behaviour (Ickes & Kidd, 1976; Brickman *et al.*, 1982). Indeed since onset of disease is often a distal event coping efforts (ie. perceived responsibility for change) may be stronger antecedents of help giving. Research suggests that intentions to provide assistance across a variety of stigmatising conditions is primarily dependent on expectancies aroused by the 'victims' way of coping (Schwarzer, Dunkel-Schetter, Weiner & Woo, 1992). Generally, causes

for illness outcomes which are stable (ie. irreversible) and uncontrollable are assumed to lead to feelings of pity while unstable but controllable causes (ie. voluntarily produced with or without intention) are assumed to lead to optimistic expectancies (Weiner, Perry & Magnusson, 1988, p.739). Therefore, causal stability is directly linked with expectancies for success.

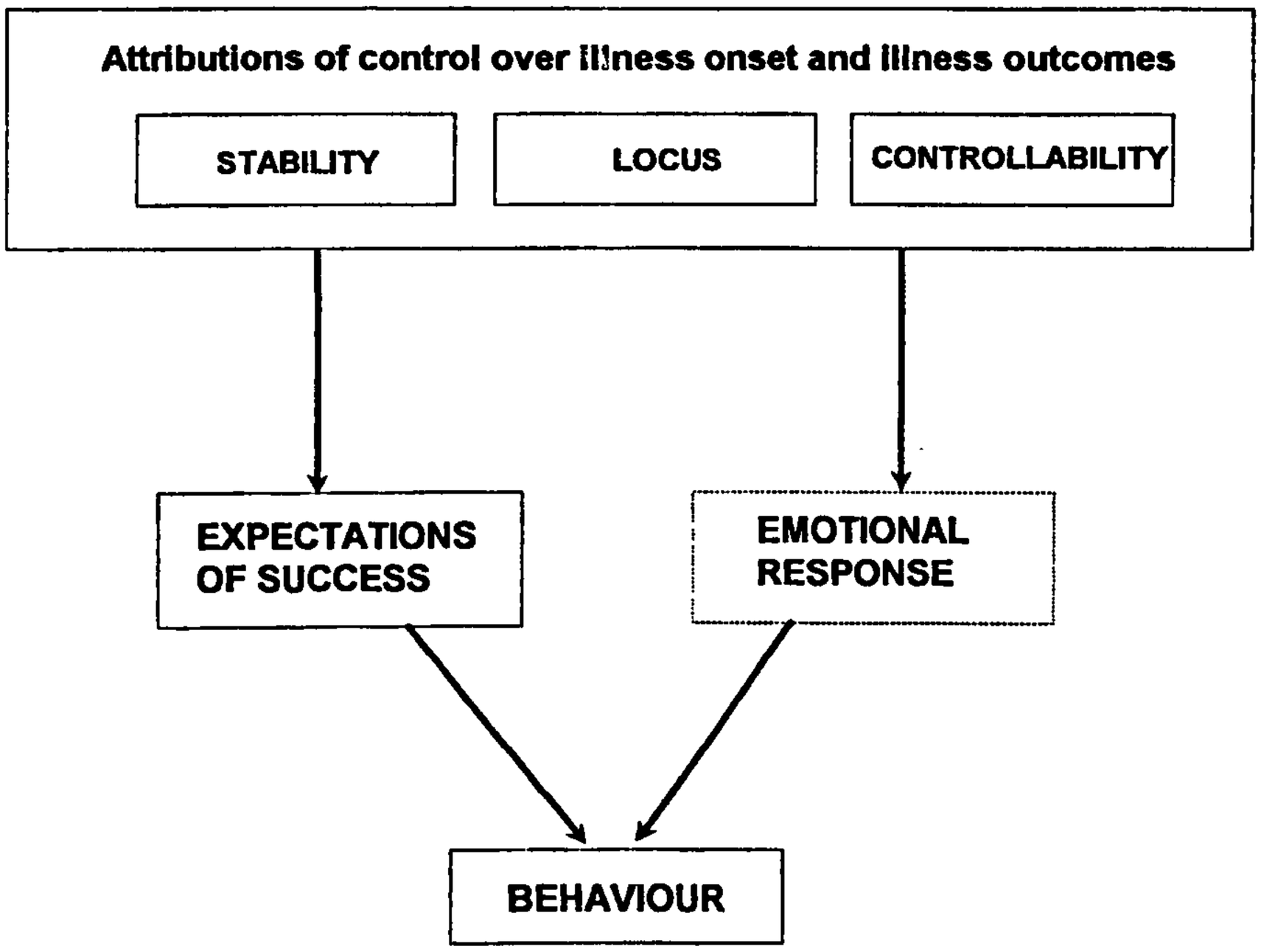

Fig 3.4: The Attribution Theory of Helping Behaviour (ATHB)

3.5.4.2. COMPUTATIONAL RULES AND CHRONOLOGICAL PROXIMITY

Weiner's model is hierarchically arranged so that expectancies and emotions are assumed to be the most proximal determinants of action and are hypothesised to serve as causal mediators of the effects of attributions of illness onset and coping appraisals on intentions of help providers. It is implied that perceived causes (eg. disease onset) proceed in temporal order future expectancies regarding the individual in terms of 'determining expectancies regarding the likelihood of recovery' (Weiner *et al.*, 1988,

p. 739). Nevertheless, expectancies and emotional reactions act as a psychological bridge between attributions of causation and behaviour and are not expected to influence behaviour directly. Such a hypothesis is consistent with SCT in which it is suggested that causal reactions for prior attainment influences future action anticipatorily by alerting self-appraisals of capabilities and perceptions of task demands (Bandura, 1992;1993). In considering the potential overlap between Weiner's ATHB and the models of health behaviour so far discussed, the ATHB can be best considered an integration of SCT (perceived success combines perceptions of both outcome expectancy and self-efficacy) with causal attributions. However, in terms of an explicit computational rule, the individual constructs are assumed to combine additively and linearly although this aspect of the model has not been elaborated. Therefore, it is entirely possible that the various types of attributions may interact such that helping behaviour may be more likely to occur under situations of high stability, internal locus and high controllability than under any other combination of attributions. However, as both Russell (1982) and Weiner (1983) note, the veridical placement of cause depends upon the subjective meaning of that cause to the individual, making *a priori* definitions and predictions problematic.

3.5.4.3. EVALUATION

In contrast to the models reviewed so far, the ATHB has been less extensively applied. However, a substantial body of evidence exists suggesting causal attributions themselves influence affective, cognitive and behavioural outcomes (see Kelley & Michela, 1980; Anderson *et al.*, 1997 for reviews). The majority of research within the patient health arena has focused on examining beliefs regarding the locus of control (Gamsu &

Bradley, 1987; Gillispie & Bradley, 1988; Georgiou & Bradley, 1992) and in understanding the functional consequences of the aetiological descriptions of disease (Marteau & Senior, 1997). Few studies have utilised aspects of Weiner's attributional theory in the prediction of health behaviour (see King, 1982 for an exception). However, unlike the decision-making models discussed so far, the ATHB has been explicitly applied and developed to explore others' decisions to give aid in the context of social stigmas such as obesity (DeJong, 1980) and is therefore directly applicable to the investigation of practice nurses' weight management. For example, Weiner *et al.*, (1988) investigated the role of attributions regarding obesity in predicting observers' behaviour. In line with Weiner's theory the results revealed the existence of an unhealthy lifestyle (eg. poor diet, smoking) led to controllable attributions for disease onset (obesity and heart disease). In contrast the existence of a healthy lifestyle led to attributions of disease onset to uncontrollable factors such as hereditary (Weiner *et al.*, 1988). Perceived onset controllability determined affective reactions with controllable causes (eg. unhealthy lifestyle as a cause of obesity and heart disease) promoting anger and lowered behavioural responses in comparison to uncontrollable causes such as genetics (DeJong, 1980; Weiner *et al.*, 1988). More, importantly however for the present thesis was the finding that the perceived efficacy of disparate interventions was guided by a belief in the stability of socially stigmatising conditions.

Although, in the area of social motivation (altruism and social support) it has been assumed that emotions play an important role (see Dovidio, 1984 for a review), support for an attribution-emotion link in helping behaviour has been mixed. For example, both Brewin (1984) and Sharrock *et al.* (1990) found optimism for success rather than affect

determined helping behaviour. However, inconsistencies may arise as a consequence of the type of helping behaviour under consideration. Research suggests that if the problem involves an ongoing threat (eg. obesity, heart disease, anorexia, drug abuse, depression) in which behaviour modification may impact on outcomes possibly because such scenarios are seen as relatively unstable and modifiable, this gives rise to a greater role for expectancies: in contrast problems for which behaviour is unlikely to have an impact on disease endpoints (eg. HIV and cancer) helping behaviour is more liable to be influenced by emotions such as pity (Schwarzer *et al.*, 1992). This suggests that emotions may provide the impetus to act in the absence of optimistic outcome expectancies. However, since this thesis is primarily concerned with the cognitive determinants of behaviour and since emotional reactions have rarely been investigated outside of the context of ATHB, the emotional component will not be discussed further.

The existence of information indicating a poor lifestyle might be poorly predictive of helping behaviour when compared with information suggesting efforts to cope or change. For example, research suggests that if the stimulus person becomes overweight due to excessive eating and lack of exercise but tries to lose weight by dieting, exercising or following a medical regimen, expectations of success and hence likelihood of help are increased regardless of onset controllability (Schwarzer *et al.*, 1992). Therefore, the functional consequences of perceptions of causality and control may differ depending on whether the focus is on occurrence or diagnosis of disease compared with the management of symptoms (Schiaffino & Revenson, 1995). However, as with the previous models reviewed the absence of a specific set of hypothesis predicting precisely when helping behaviour will be strongest makes

intervention development problematic: is it better for an overweight person to be perceived as overweight due to excessive eating and lack of exercise (unstable-controllable) but potentially open to blame or as a consequence of genetics (stable-uncontrollable) and therefore blameless. Moreover, the relationship between responsibility for onset causality and responsibility for recovery (eg. the person does/does not try to lose weight) is not defined. Since many of the paths between attributions are unspecified it is therefore unclear how such beliefs should be combined in order to provide an optimal set of behavioural predictors.

3.5.5. THE SELF-REGULATION MODEL (SRM)

3.5.5.1. DESCRIPTION OF ILLNESS COGNITIONS

According to Leventhal and colleagues the relationship between attributions and behaviour can be considered within the behavioural system provided by the common-sense model of self-regulation (Leventhal, Nerenz & Steele, 1984; Leventhal, Diefenbach & Leventhal, 1992, Benyamini, Leventhal & Leventhal, 1997; Leventhal, Benyamini, Brownlee *et al.*, 1997; see fig. 3.5). The constituents of the behavioural system are as follows: (i) the representation of an illness/threat, (ii) a set of procedures for threat-illness management (ie. behaviour), and (iii) criteria for evaluating outcomes.[15] Coping procedures are conceptualised as actions taken to regulate feelings or actions taken to solve problems (Leventhal *et al.*, 1997, p. 31). The representation

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[15]The set of procedures for illness management refers to behaviour. It is assumed that differential representations will lead to differential choice of goal pursuit. The outcome evaluation component deals with the extent to which behaviour has been successful and adds a recursive element to the model which remains largely unspecified. Since this thesis is primarily concerned with the motivation phase of decision-making, the action phase of the SRM will not be discussed further (see Leventhal *et al.*, 1997).

of an illness comprises five broad cognitive dimensions: the identity of the illness including label and symptoms; the perceived cause of the illness; the time-line or how long the illness will last; the consequences of the illness on the person's life; and beliefs about the curability or controllability of the illness (Leventhal *et al.*, 1984; Leventhal & Nerenz, 1985; Leventhal *et al.*, 1997). In otherwords illness representations deal with questions regarding what is this illness, what caused it, how can it be controlled/cured, how long will it last, and how will it/has it affected me (Horne, 1997). These schema or cognitive representations act as a framework for guiding and evaluating efforts to deal with an illness. Therefore, according to the SRM the representation of illness (rather than the representation of behaviour or merely the perception of risk of disease) guides the selection of coping procedures (ie. action).

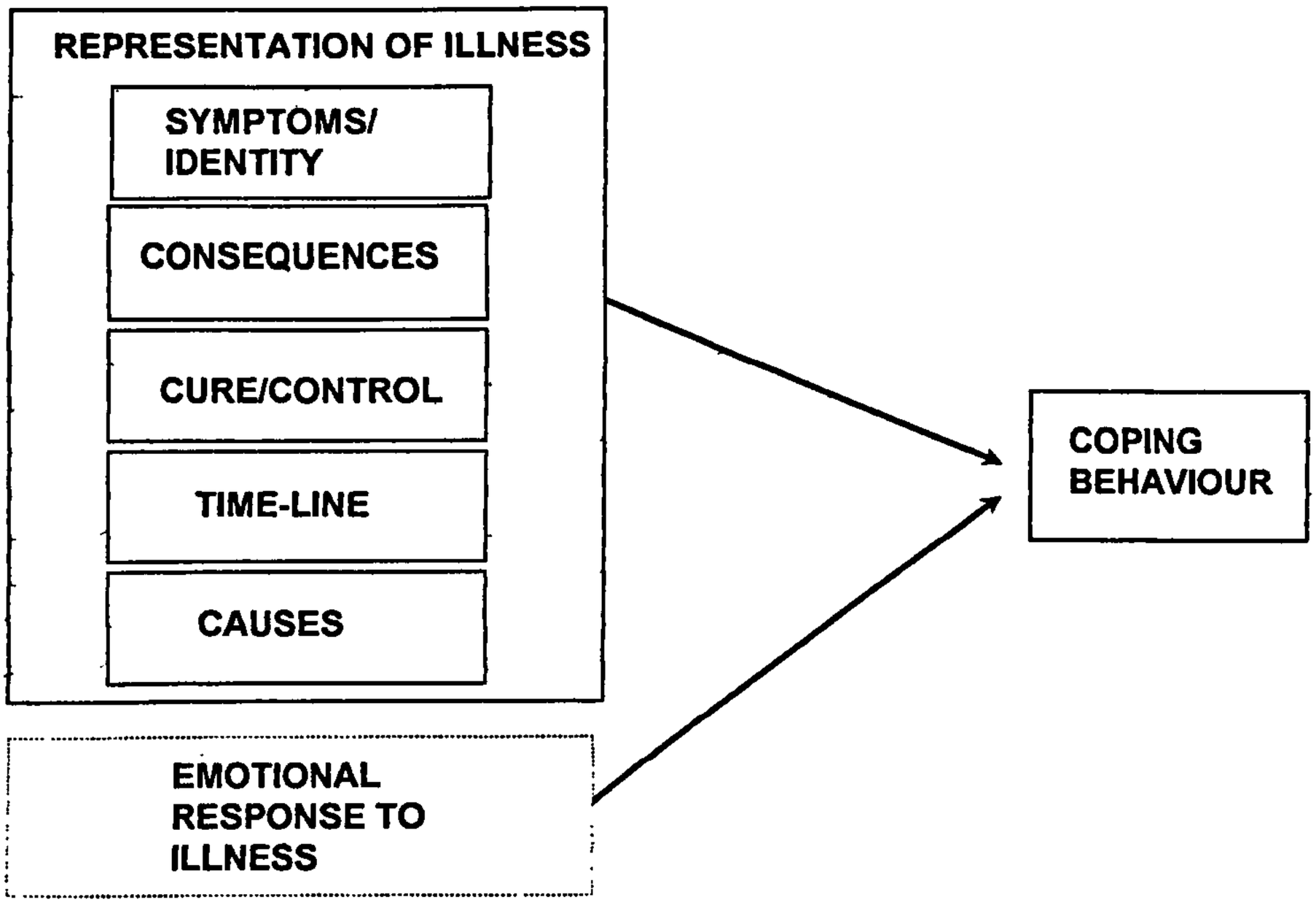

Fig. 3.5: The Self-Regulatory Model of behaviour (SRM)

More recently, behavioural evaluation of procedures (ie. beliefs about treatments) have

explicitly been included in terms of 'the representation of procedures' for dealing with illness (Leventhal *et al.*, 1997, p. 33). Leventhal *et al.* (1997) argues that there is more to procedures than the two factors emphasised by SCT (ie. self-efficacy and outcome expectancy). Instead procedures are explicitly linked to the definition (representation) of the problem and should include five procedural attributes. Treatment beliefs have recently been elaborated by Horne (1997) whose research suggests that general beliefs about treatments such as medication (eg. medication is harmful) are mediated by specific expectancies about the role of medication in affecting illness (ie. specific outcome expectancies such as perceived necessity, efficacy of medication and negative consequences). However, while beliefs about medication were related to adherence, they were unrelated to beliefs about other forms of treatment. Horne (1997) suggests that both the representation of illness and the representation of treatment are direct antecedents of behaviour. In addition, it is hypothesised that illness representations are indirectly related to behavioural performance via their effects on treatment beliefs: the representation of behaviour is assumed to partially mediate the representation of disease. Finally, according to the SRM while illness cognitions may lead to intentions, intentions do not themselves become actions without action plans, a proposition which accords well with current theoretical developments within the field of SCMs and suggests that intentions could be added to the original model.

3.5.5.2. COMPUTATIONAL RULES AND CHRONOLOGICAL PROXIMITY

Self-regulatory theory (SRT) proposes two largely independent processing systems: the first is concerned with coping with objective problems of illness and the second with the emotional reactions to threat. No temporal order is implied since both are

considered coping responses. As with Weiner's model research has concentrated more on the cognitive representation of disease; the representation of emotion has been largely unexplored within the patient realm and will not be discussed further (see Cameron, 1997 for a review). However, in terms of computational rules, the individual constructs are assumed to combine additively and linearly although this aspect of the model has not been elaborated. According to the SRM illness representations are hypothesised to shape the selection of coping procedures so that the representation of the health threat and the coping procedure should be consistent to produce a particular course of action. It is hypothesised that the mental representations of illness influences the type of 'coping procedure' adopted which implies that the representation of disease proceeds the representation of action. Coping 'procedures' may include coping styles, emotional responses, behaviour and intentions as well as self-efficacious cognitions (Leventhal *et al.*, 1997, p. 27).

3.5.5.3. EVALUATION

Although, research within the attribution theory tradition also bears on illness cognitions (see Weiner's work above), the various components of illness representations have been shown to have implications for patients regarding adherence to treatment regimes; disability; psychological adjustment and the decision to seek health care (eg. Cameron, Leventhal & Leventhal, 1995; Moss-Morris, Petrie & Weinman, 1996; see Croyle & Barger, 1994; Petrie & Weinman, 1997 for reviews). Further, research suggests illness-related beliefs influence many behaviours that fall outside the traditional definition of illness behaviour including discrimination and prejudice (Croyle & Barger, 1994). According to a recent systematic review of research conducted between 1985 and 1995

by Scharloo and Kaptein (1997) patient outcomes were related to illness identity in 5/5 studies; causes in 10/11 studies; time-line in 3/6 studies; consequences in 17/17 studies and control beliefs in 26/36 studies. While such results appear impressive particularly given the heterogeneous operalisations, much research has been confined to the examination of unidimensional relationships and restricted to the measurement of one or two illness dimensions generally using specific locus of control scales.

Furthermore, the SRM does not provide any theoretical elaboration regarding the interrelationship between the various belief-based measures. Therefore, like many of the SCMs reviewed, much of SRT is composed of unspecified paths. Moreover, the beliefs contained in the representation of illness are not explicitly arranged hierarchically. This is despite research that suggests causal attributions influence behaviour via their impact on self-efficacy (a procedural evaluation) rather than operating directly on performance (Weiner, 1980; King, 1982; Bandura, 1992; Hospers, Kok & Stecher, 1990; Kok *et al.*, 1992). For example, King (1982) argues that attributions of causation influence beliefs about illness which then influence behaviour. Moreover, research by Cameron (1997) suggests that although vulnerability beliefs are directly related to beliefs about social influence and perceived consequences, vulnerability does not directly predict either habits or intentions to have a mammogram. Instead, intentions were predicted by habit, social influence and performance barriers explaining 38% of the variance. Cameron (1997) suggests vulnerability acts as a catalyst for the development of elaborated representations of cancer and its control that in turn influence screening decisions. Therefore, parallelling research findings from other SCMs, research within the self-regulation framework suggests the effects of

perceived risk on intentions is mediated by other representational attributes such as social influences and perceived consequences (ie. behavioural expectancies). However, while beliefs about control are often measured using the multidimensional locus of control (Scharloo & Kaptein, 1997), an operalisation in keeping with the original definition of the cure/control dimension, Leventhal and Nerenz (1985) suggest a broader conceptualisation that includes coping expectations (eg. response effectiveness and self-effectance). Although including self-efficacious beliefs would appear to detract from the main focus of the model that of the representation of disease.

Nevertheless, the strength of the SRM lies in its development: illness representations have emerged out of studies of how patients describe illness and can be contrasted with other SCMs that have arisen out of theoretical developments. As a consequence, operalisation of the main variables is still in the development stage and no gold standard measure has emerged (Weinman & Petrie, 1997) although a variety of questionnaires have been developed which either implicitly or explicitly examine illness cognitions (Turk, Rudy & Salovey, 1986; Schiaffino & Cea, 1995; Weinman, Petrie, Moss-Morris & Horne, 1996). However, several of the constructs have commonalities with those contained in other SCMs including ATHB (causes, time-line, cure/control) and the HBM (symptoms, consequences). Since illness representations comprise of five interrelated attributes whose distinctiveness has not been empirically established, there is the potential for an overlap between time-line/consequences and causes/control without careful operalisation (Scharloo & Kaptein, 1997).

Moreover, since the influence of the various dimensions differs depending on the type

of illness under investigation, the linkages between individual cognitions are unspecified rendering a priori predictions about which dimensions will be influential problematic. However, such a criticism is not unique to the SRM and similar concerns have been raised regarding the other SCMs reviewed (Wallston & Wallston, 1984). Finally, the criticisms previously levelled at the HBM regarding the pivotal role afforded threat perceptions are applicable to the SRM. However, the more recent attempt to connect disease threats to the self via evaluations of coping procedures thereby combining illness representations (the source of motivation) with both an action plan (a concrete image of a series of acts and goals) would appear to make the model compatible with other SCMs which focus on the representation of behaviours. The move to incorporate the representation of treatment therefore appear to make the model appropriate for investigating practice nurses' clinical decisions (Leventhal *et al.*, 1997; Horne, 1997).

3.6. EMPIRICAL COMPARISON OF SOCIAL COGNITION MODELS

Although, the importance of theory comparison in developing attitude-behaviour models has been highlighted (Sutton, 1998*c*), empirical investigations between models have been sparse particularly considering the widespread and diverse applications of single model investigations. For example, King (1982) has conducted the only study to compare the HBM with Weiner's attribution theory. The results revealed that screening behaviour could be predicted by intentions, control over health, barriers, benefits, response efficacy, controllability and external causes with intention explaining most of the variance in behaviour. No studies have compared SRT with any of the other SCMs discussed. More research has been conducted exploring the relationship between the

TRA and the HBM. Evidence generally suggests the TRA outperforms the HBM (Rutter, 1989) even with the addition of subjective norms (Warwick *et al.*, 1993). For example, Warwick *et al.* (1993) report that the effects of benefits and barriers on intentions were totally mediated through the direct measures of attitudes, suggesting that behavioural evaluations are better conceptualised in the TRA than in the HBM (ie. the use of direct rather than belief-based measures). However, other studies have reported that the HBM outperforms the TRA (Hill *et al.*, 1985; Mullen, Hersey & Iverson, 1987) or that the two models explain similar levels of variance (Conner & Norman, 1994). Including intention under the HBM has been shown to increase its predictive power (Quine, Rutter & Arnold, 1998). In a recent meta-analysis Zimmerman and Vernberg (1994) report that the TRA explained on average 34% of the variance in behaviour compared to 24% explained by HBM, with the greater predictive power largely due to the inclusion of a measure of intentions.

Even fewer studies have compared the predictive ability of the TPB with the HBM although several studies have tested an extended HBM with self-efficacy as an additional variable thereby allowing tentative conclusions to be drawn. For example, Mullen *et al.* (1987) report that the HBM outperformed the TRA in predicting health behaviour at 8-month follow-up. However, since self-efficacy emerged as the key predictor, this suggests that the TPB may have performed at a comparable level. While Montano and Taplin (1991) found that the TRA outperformed the HBM (severity, susceptibility) in predicting mammography. The addition of Triandis'(1977) facilitating conditions (equivalent to Ajzen's indirect measures of control beliefs covering ratings of ease/difficulty and specific barriers) added to behavioural prediction while self-

efficacy did not thus providing mixed support for the TPB. However, Montano and Taplin do not make it clear how self-efficacy was operationalised or to what extent control beliefs and self-efficacy were correlated. More recently, Bish *et al.*, (1998) found the TPB to outperform the original four variable HBM for the prediction of intentions to attend for cervical screening (51% *vs* 4%) although in the latter study neither model emerged as significant predictors of behaviour.

Moreover, research suggests that SCT generally outperforms both the HBM (eg. Seydel *et al.*, 1990) and the TRA (eg. Dzewaltowski, 1989) and the TPB (Dzewaltowski, Noble & Shaw, 1990). The results reported by Dzewaltowski *et al.* (1990) reveal that the TPB (with PBC conceptualised as perceived control) did not outperform the TRA; SCT outperformed the TRA. However, self-efficacy emerged as the only independent predictor of behaviour. Therefore, to the extent that it can be argued that self-efficacy is part of Ajzen's PBC construct, the latter finding would support the TPB. More recently, in a cross-sectional study Wulfert *et al.* (1996) compared the TPB and the HBM with SCT as predictors of safer sex. The results revealed that the HBM explained 28% of the variance in behaviour with only barriers (ie. pleasure reduction and interpersonal concerns) emerging as significant determinants. In contrast, the TRA explained 84% of the variance in behaviour with intentions as the only direct predictor of action. While SCT explained 80% of the variance in behaviour with the effects of barriers (ie. outcome expectancies) and peer-group influences being mediated by self-efficacy. In a test of an integrated model which included all significant predictors, intentions emerged as the only direct antecedent of behaviour (the effects of barriers being mediated by self-efficacy, and the effects of self-efficacy being mediated by

intentions) a finding which is consistent with predictions from both the TPB and SCT. Making comparisons across studies is problematic. Generally models are tested in separate multiple regressions and the degree of explained variance compared. However, this assumes that both sets of predictors are equally valid and reliable indicators of the model constructs, an assumption which may not be realistic. As already discussed the various concepts can be operationalised in numerous ways without detracting from their original definition. Unreliability of measures can have a profound influence on correlational analysis and explained variance has been shown to be a poor indicator of effects size (Sutton, 1998*d*). In addition since high correspondence between measures of beliefs and behaviours leads to better predictions (Bagozzi, 1981), it is unclear whether the superior predictive power of any particular model or construct is an artifact of measurement error. For example, the TPB lays out strict criteria for its application (including elicitation of salient beliefs and correspondence amongst measures) however violations are common (eg. Dzewaltowski *et al.*, 1995) serving to further complicate interpretations of empirical comparisons. Therefore, it is unclear whether superior or inferior predictive power is a consequence of conceptual superiority or an artifact of operational procedures.

Moreover, constructs such as intentions and self-efficacy which have been recently added to the HBM are inconsistently included in analysis, particularly in earlier studies. Since self-efficacy and intentions are generally the most proximal predictors of behaviour, model comparisons may not be equivalent. For example, the reported success of behavioural prediction using the HBM has often been a consequence of the addition of measures of self-efficacy and intentions (eg. Kelly *et al.*, 1991). Therefore

it is unclear from the available evidence whether or not the HBM for example can be considered equivalent to the TPB if measures of PBC and intentions were included. Within the context of this thesis it would appear that the available evidence from empirical comparisons of SCMs is insufficient to establish which constructs would provide the best prediction of practice nurses obesity management decisions. This raises the issue of what is required from tests of SCMs.

3.7. A CONCEPTUAL INTEGRATION

While the testing of individual models may be empirically useful in identifying predictors of individual behaviours, in the absence operalisational or applicational homogeneity, tests of single models are less useful in developing theory. The SCMs reviewed within this thesis differ with regard to (i) the specific type of cognitive representation explored (behaviour *vs* disease); (ii) the operalisational definitions adopted; and (iii) the temporal priority afforded the various beliefs. However, since each SCM provides a set of hierarchically organised behavioural antecedents of self-regulation, integrating the various dimensions into one theoretical framework would seem fruitful. A conceptual integration of the main constructs would promote theory development by aiding cross-study comparisons, facilitating discussion of commonalities and differences and permitting hypothesis testing with regard to identifying the most proximal determinants of action. Since, the SCMs reviewed in this thesis either emphasised the cognitive representation of illness or the cognitive representation of behaviour, this distinction was used as an organising framework for a critical analysis of the individual illness-related and treatment-related beliefs. The main constructs derived from the various SCMs reviewed are summarised in table 3.1.

and the commonalities and differences are discussed in more detail below.

Table 3.1: Comparison of constructs contained within the various models

	SCT	HBM	TPB	ATHB	SRM
REPRESENTATION OF THE BEHAVIOUR/TREATMENT PROCEDURES					
Evaluation of coping procedures (ie. outcomes of behaviour)	Action-outcome expectancies	Benefits & barriers	Behavioural beliefs	Perceived success of helping is a specific outcome expectancy	Evaluations of treatment procedures have been added to the original
Perceived control over behaviour	Self-efficacy	Self-efficacy has been added to the original and is part of the barriers dimension	Perceived behavioural control	Implicit in perceived success of helping which overlaps with self-efficacy	No
Social norms regarding the behaviour	Peer group comparisons underlie self-efficacy	No	Subjective norms & normative beliefs	No	No
REPRESENTATION OF THE ILLNESS					
Evaluation of threat (ie. consequences of inaction)	Situation-outcome expectancies	Severity & Susceptibility	Behavioural beliefs	No	Symptoms & Consequences
Perceived control over disease outcomes	Implicit in self-efficacy	Implicit in barriers	Implicit in perceived behavioural control	Perceived coping efforts for illness outcomes (stability & controllability)	Time line (stability) & Cure/control (volitional controllability)
Attributions of causation of disease	No	No	No	Causes of disease (locus of control)	Causes of disease (locus of control)

3.7.1. THE REPRESENTATION OF OWN BEHAVIOUR

3.7.1.1. CONTROL EXPECTANCIES

Self-efficacy, perceived success and perceived behavioural control

As can be seen in table 3.1 the majority of decision-making models include some form of control or mastery expectancies. Under SCT control expectancies are conceptualised in terms of self-efficacy. According to SCT self-efficacy is an antecedent of outcome expectancies, intentions and behaviour. However, self-efficacious thinking cannot be equated merely with the possession of requisite skills to perform the behaviour: successful performance depends not only on the availability of skills but also on the belief that one will be able to effectively utilise the skills (Bandura, 1986). Although the barriers dimension of the HBM is similar to self-efficacy, encompassing factors relating implicitly to successful performance (Weinstein, 1993) the two constructs are not identical (Kelly *et al.*, 1991). As noted by Orbell *et al.* (1996) the barriers dimension includes actual barriers such as physical limitations (ie. control over external events), psychological barriers (ie. self-efficacy) and costs of action (ie. outcome expectancies). The multidimensional nature of the barriers dimension suggests differentiating self-efficacy from costs would provide conceptual clarity (Rosenstock *et al.*, 1988). Within the ATHB, control expectancies are implied in the concept of perceived success. Weiner (1985) argues that lowered expectations of success lead to less adaptive task behaviour due to lowered energy investment in task pursuit. Such a contention parallels Bandura's (1977) argument regarding the relationship and function of self-efficacy on behaviour. Therefore, it would appear that while perceived success

is more properly defined as a specific outcome expectancy, Weiner (1985) clearly combines it with the role of self-efficacy (see below). Within the TPB, control expectancies are defined by the PBC construct. PBC is hypothesised to be both an antecedent of motivation (intentions) and a direct predictor of behaviour (Ajzen, 1991) and accords with Bandura's theorising regarding the role of self-efficacy. Indeed several authors have argued for the functional symmetry of the two variables (eg. Schwarzer & Fuchs, 1996). However, a distinction can be made between self-efficacy which 'focuses on factors internal to the individual' and PBC which reflects both 'external factors' such as 'the availability of time and the cooperation of others' plus 'internal factors such as ability' (Ajzen & Timko, 1986, p. 262). This definition of PBC therefore combines perceptions of internal barriers with physical constraints (indeed PBC is assumed a proxy measure for actual control, Ajzen, 1988).

Perceived locus of control, self-efficacy and causal attributions

Therefore, by including external constraints the PBC construct would appear to be broader than self-efficacy being more aligned to the concept of perceived control as proposed by Rotter (1966). According to Rotter (1966), generalised[16] expectancies that outcomes are determined by ones actions (ie. internal locus of control) or by forces

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[16] More recently, the multidimensional health locus of control (MDHLC) adapts Rotters generalised scale and focuses on explanations for illness, in terms of the extent to which outcomes of behaviour are controlled by internal, external, or powerful others (Wallston & Smith, 1994). However, despite wide spread application the MDHLC has received inconsistent empirical support (Bennett, Moore, Smith, Murphy & Smith, 1995; Bennett, Norman, Murphy, Moore & Tudor-Smith, 1997) although more predictive success has been obtained via illness-specific locus of control measures (Bradley, Brewin, Gamsu & Moses, 1984; Gamsu & Bradley, 1987; Georgiou & Bradley, 1992).

beyond ones control (ie. external locus of control) influences behaviour.[17] Perceived control is therefore defined as a 'belief that one has at ones disposal a response that can influence the aversiveness of an event' either by changing the 'material circumstances' or by altering the 'psychological impact' (Skinner, 1992; Mischel *et al.*, 1996). Therefore, when control is conceptualised as the extent to which others or events may interfere with behavioural performance, PBC would appear to be functionally analogous with the original perceived control concept as defined by Rotter (1966). However, Wallston (1997) draws a distinction between self-efficacy and locus of control: the former reflects control over behaviour the latter control over an outcome (p. 152). This accords with Bandura who argues that Rotter's scheme is primarily concerned with causal beliefs about action-outcome contingencies rather than with personal efficacy (Bandura, 1977 p. 204). However, both Weiner's (1985) beliefs about others' coping efforts and the cure/control component of SRT which is defined as an 'expectation for future recovery' are conceptually similar to locus of control expectancies since they refer to control over illness outcomes (Leventhal & Narenz, 1985). According to Bandura (1977), perceived self-efficacy and locus of causality must be distinguished because convictions that outcomes are determined by ones own actions can have any number of effects on self-efficacy and behaviour. People who regard outcomes as personally determined but who lack the requisite skills would experience low self-efficacy and view action as futile. While causal beliefs and self-efficacy refer to different phenomena, causal ascriptions of behaviour to skill or to chance can mediate

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[17] Rotter (1966) used locus of control to refer to expectations for future outcomes. Individuals with an external locus of control view events as not under their control and therefore unmodifiable by rewards and punishments. In contrast locus of control in Weiner's (1980) attribution theory refers to causal explanations of past events (eg. onset of disease) as well as expectations for coping or recovery.

the effects of performance attainments on self-efficacy. Therefore, according to SCT, although individuals may feel responsible for own health (internal locus of control) they may nevertheless perceive themselves incapable of performing the required activities (low self-efficacy). Therefore, since self-efficacy is considered a function of a person's perceived skills to effectuate change, this can be contrasted with perceived locus of control that is concerned primarily with beliefs about the causes of certain outcomes.

Perceived behavioural control revisited

Given the above distinction between perceived locus of control and self-efficacy, it would appear that PBC encompasses a dual focus incorporating the appraisal of both external constraints (perceived locus of control) and internal constraints (self-efficacy) as components of the same concept (Terry & O'Leary, 1995). It is clear from the rationale Ajzen provides for the inclusion of PBC for situations of 'low volitional control' (Ajzen & Madden, 1986) that it was initially conceptualized as an estimate of the extent to which the person has control over whether they are able to perform the behaviour in terms of freedom from (external and internal) impediments. Ajzen explicitly defines PBC as an assessment of 'perceived ease or difficulty of performing the behaviour' (Ajzen & Madden, 1986, p. 457; Ajzen, 1988, p.132). However, Schifter and Ajzen, (1985, p. 844) suggest that PBC reflects past experience plus anticipated impediments and obstacles. Therefore, PBC may contain perceptions of actual task difficulty as well as self-referent ratings of competence (Schwarzer & Fuchs, 1996).

Perceived control and self-efficacy

This dual focus of the PBC construct is in line with several authors (Bandura, 1977;

Triandis, 1977) who argue that it cannot be assumed that there will be a correspondence between the person's perception of the extent to which external barriers may impede the performance of the behaviour and their judgement that the behaviour will be easy to perform. Therefore, the belief that one can control the enactment of an action may differ from the belief that one can successfully execute it (Mischel *et al.*, 1996) particularly for behaviours for which it would be expected that external control would be low. On the one hand, individuals can appraise the extent to which they have control over whether they perform the behaviour, while on the other hand they can appraise the behaviour in terms of their capability to perform it. It is therefore possible for an individual to perceive many external barriers to performing the behaviour, yet have the confidence in their ability to overcome them and perform the behaviour. People may believe they have little control over behavioural performance but believe they can use their skills to perform behaviour. In support of this distinction, several studies have reported differential effects for the two variables (eg. Dzewaltowski *et al.*, 1990; Terry, 1993; Terry & O'Leary, 1995; Bish *et al.*, 1998). Therefore, although Ajzen (1988; 1991) combined notions of self-efficacy and perceived control in the concept of PBC, it can be argued that the two variables are theoretically distinguishable.

Self-efficacy and perceived success

Despite a distinction between different types of control expectancies (ie. self-efficacy and perceived locus of control), the question arises as to wether they are conceptually distinguishable from outcome expectancies. In otherwords since self-efficacy for example, functions as a barrier to action should it be viewed as part of the cost-benefit dimension of the HBM (Weinstein, 1993; Janz & Becker, 1984) or be incorporated

within behavioural beliefs under the TPB (Weinstein, 1993). While evaluations of barriers may implicitly include references to both internal and external controllability, they are more properly defined as outcome expectancies (see below). Similarly, since the belief that one can control the enactment of an action is closely related to the belief that one can successfully execute it, (as already argued) ATHB can be said to contain self-efficacy under the guise of perceived success. Both concepts (perceived success and self-efficacy) are related to estimates about the likelihood of certain outcomes and both are based on the cognitive appraisal of past experience (Bandura, 1986, p.349; Weiner, 1986, p.181). Teasdale (1978) argues that in defining efficacy as the conviction that one can 'successfully execute the behaviour required to produce the outcomes' confounds beliefs about ability to make a response with expectations concerning the outcome of the response. Therefore, both self-efficacy and outcome expectancy are assessed by having people predict degrees of success. Consequently, several studies using Weiner's attributional processes have used self-efficacy ratings as a measure of expectancy of success and some authors claim they are identical concepts (Kirsch, 1985; 1986). For example, Kirsch (1985, p. 826) states "clearly there is little difference between the belief that one will be successful if she or he attempts a task and the belief that one has the ability to successfully perform a task". Overall, it would appear that while the models reviewed contain a single measure of control expectancies, perceived locus of control is distinct from self-efficacy and may play a differential role in behavioural prediction. Moreover, while self-efficacy and perceived control are closely related, as will be argued below it would appear that they are nevertheless conceptually distinct.

3.7.1.2. BEHAVIOURAL COPING EXPECTANCIES

Outcome expectancies, benefits, barriers or behavioural beliefs

As can be seen from table 3.1 the majority of models explicitly include a construct measuring expected outcomes of behaviour. Bandura (1977, p.193) defines an outcome expectancy as a person's estimate that a given behaviour will lead to certain outcomes. Therefore, while efficacy expectancies reflect the person's judgement about whether he or she can perform the behaviour, outcome expectancies reflect the extent to which the person believes the behaviour will engender certain outcomes and in part the extent to which the person believes that the environment will render behaviour efforts unsuccessful (Bandura, 1882). Terry and O'Leary (1995) suggest outcome expectancies can be regraded as being similar to the notion of perceived behavioural control (unconfounded by efficacy expectancies). However, since outcome expectancies reflect in part, the belief that the 'punitiveness of the environment' will render a person's behavioural efforts unsuccessful (Bandura, 1982, p. 140), using this definition they are comparable to the perception that external events may interfere with successful performance of the behaviour. Since perceived success and outcome expectancies both deal with the possibility of improvement of the condition, perceived success can be best considered a specific outcome expectancy similar to response efficacy (Schwarzer *et al.*, 1992). Therefore, while it is clear from Bandura's definitions of self-efficacy and outcome expectancy that there is the potential for confounding as a consequence of the conceptual overlap between the two measures (particularly if the latter include performance evaluations such as likelihood of success) it would appear useful to maintain the distinction between self-efficacy and outcome expectancies.

Outcome expectancies are conceptually identical to the HBMs benefits/barriers concept (Rosenstock *et al.*, 1988) and the behavioural beliefs construct in the TPB (Weinstein, 1993). In its original formulation SCT includes outcome value making the TPB and SCT identical on a measurement level. Whether or not superior prediction of behaviour is obtained by including outcome value and the advantages of the accompanying multiplicative rule is open to empirical verification. However, the measurement of beliefs in the TPB differs from outcome expectancies and benefits of behaviour. Based on the idea that people do not make decisions on an examination of all relevant outcomes but rely instead on a small set of salient outcomes, the TPB uses an elicitation procedure to govern the type of outcomes measured. Therefore, theoretically outcome beliefs as defined by the TPB can refer to any outcome that can be expected as a consequence of action.

However, while the social cognition theories reviewed are unanimous in their assertion that some form of evaluation of the potential outcomes of behaviour underlies decision-making, each model anticipates such evaluation to play a more or less proximal role in self-regulation. According to the HBM benefits and barriers impact directly on behavioural decisions (including intentions). Similarly, Weiner's ATHB posits a single outcome expectancy (perceived success) to influence behaviour directly. Although, Leventhal's original SRM does not include evaluations of the outcomes of behaviour, Horne's (1997) work on treatment preferences could be understood in terms of behavioural outcomes. According to Horne (1997) specific beliefs about treatment preferences influence coping procedures directly however no distinction is made between intentions and behaviour. In contrast SCT envisages outcome expectancies

to be largely indirectly related to behaviour via their impact on self-efficacy and intentions. While the TPB postulates an even more distal role for behavioural beliefs hypothesising their effects to be completely mediated by a more direct measure of attitudes towards behaviour. Attitudes towards behaviour being themselves mediated by intentions and PBC. Therefore, while the models reviewed contain what would appear to be a conceptually analogous variable evaluating behavioural outcomes, such expectancies are afforded a differential role in behavioural prediction.

3.7.1.3. SOCIAL EXPECTANCIES

Normative pressure

As can be seen in table 3.1 the TPB is the only model to explicitly include a separate social pressure component as an independent predictor of behavioural decisions. Within the HBM and SRT normative influences could be subsumed under benefits and consequences. Within SCT social influences are included under peer group comparisons but are assumed to be distal predictors of behaviour in terms of having their impact via self-efficacy. Although it has been suggested that normative beliefs are empirically indistinguishable from behavioural beliefs and should therefore be combined (Miniard & Cohen, 1981), there are both theoretical reasons and empirical support for maintaining the distinction (Fishbein & Ajzen, 1981). Nevertheless, in investigations of patients' health-related behaviours subjective norms have emerged as the weakest predictor of intentions (Godin & Kok, 1996; Sheppard *et al.*, 1988 for meta-analysis). However, the weaker results obtained within the patient arena may result from normative influences simply being relatively unimportant in predicting individual

health behaviours. In contrast, the few studies to examine health professionals' behaviour have so far revealed a stronger role for the subjective norm construct (eg. Millstein, 1996). Since health professionals' behavioural performance is an inherently social act requiring some form of interaction with a patient, there is good reason to suppose that normative influences may be relatively more important in predicting provider responses.

Attributed norms vs personal norms

However, while subjective norms are defined as perceptions of social pressure to perform the behaviour (Ajzen, 1991), they are generally operationalised in terms of subjective perceptions of social approval. This has led a number of authors to suggest that the poorer predictive power of the subjective norms component may result from operalisational issues, in particular failure to capture the full range of normative influences (Conner & Sparks, 1996; Conner & Armitage, 1998). Several types of normative pressure are theoretically discernable. A distinction can be made between the norms people hold for themselves (ie. personal norms) and attributed norms (Ajzen & Fishbein, 1975; Ajzen, 1991; Triandis, 1977). Attributed norms can be divided into injunctive norms that refer to perceived social approval from others (akin to the Fishbein-Ajzen subjective norm) and descriptive or behavioural norms that describe what others do (Cialdini, Kallgren & Reno, 1991). As a description of others' behaviour, behavioural norms are therefore conceptually similar to Bandura's concept of peer group comparisons by which own actions are evaluated in relation to the perceived behaviour of others (Bandura, 1986). The theoretical distinction between injunctive and behavioural norms has received empirical support although the predictive

power of behavioural norms as a direct antecedent of intentions may be low (Wulfert & Wan, 1993; Conner, Martin, Silverdale & Grogan, 1996). Although, others have argued that such measures should be viewed as indicators of the same construct, that of 'perceived social pressure' as contained in the TPB (Fishbein, 1993), evidence suggests that personal norms and in particular moral norm could usefully be included in the TPB (Ajzen, 1991).

Moral norms

Moral norms refer to perceptions of correctness and cover 'personal feelings of responsibility to perform, or to refuse to perform a certain behaviour' (Ajzen, 1991, p. 199). Research suggests that personal norms in the form of moral norms are predictive of behaviour that contains an ethical component (Manstead & Parker, 1995; Parker, Manstead & Stradling, 1995). For example, Raats, Shepherd and Sparks (1995) report that perceived moral obligation for family health predicted intentions to consume low fat milk. Similarly, Vermette and Godin (1996) report that personal normative beliefs were superior predictors of nurses' intentions to provide home care than the traditional measure of subjective norms. In a recent review Conner and Armitage (1998) report moral norms to be a significant concomitant of intentions for 9/10 studies and to significantly correlate with attitudes, subjective norms and perceived control. However, it would seem reasonable therefore to suppose that for some behaviours it may be more important to distinguish between the different types of norms (Armitage & Conner, 1998) in particular those which exhibit a unambiguous moral obligation (eg. to tell the truth) or clear social obligation (eg. to give blood). For behaviours for which moral norms are less relevant, the concept reduces to personal norm (Cialdini *et al.*, 1991) and

the overlap with intentions may be high (Nucifora, Gallois & Kashima, 1993).

3.7.2. REPRESENTATION OF DISEASE

3.7.2.1. ATTRIBUTIONS CAUSATION

As can be seen in table 3.1, both SRT and ATHB are the only two models to explicitly incorporate attributions of causation for disease onset. Weiner places attributions along a number of dimensions including the locus or origin of causality (internal *vs* external) and the degree of stability of the cause over time (static *vs* variable). However, it is entirely possible to simultaneously believe that an illness is controlled by personal behaviour but caused by an external event (eg. a virus). Therefore, a distinction can be made between causes of obesity (ie. attributions for weight gain) and the solutions to obesity (ie. attributions of failure to lose weight) (Brickman *et al.*, 1982; Schiaffino & Cea, 1995) and ATHB also includes measures of the degree of controllability or responsibility for altering the cause (nonvolitional *vs* volitional). Within SRT, 'cure/control' and 'time-line' are conceptually similar to expectations for future recovery as defined by Weiner (1985) since both components deal to a certain extent with aspects of stability and volition governing future recovery. Therefore, a clear conceptual distinction can be made between locus of control beliefs which refer to perceived control over the outcomes of behaviour and attributions which refer to the causes of disease.

However, SRT and ATHB differ in terms of the expected functional impact of attributions on behaviour. According to SRT, attributions for disease onset are directly

related to behaviour and/or intentions. In contrast according to ATHB expectancies act as a psychological bridge between causal attributions and behavioural decisions. Expectancies influence attributions and attributions influence subsequent expectancies. Attributing stability to a previous outcome is likely to give rise to the expectancy that similar outcomes will occur in the future: if success is attributed to an external unstable cause (eg. luck) future success will be unexpected (Weiner, 1986). Both Furnham and Steele (1993) and Kirscht (1983) argue that locus of control beliefs are to some extent based on causal attributions. Similarly, Bandura (1982) suggests that high self-efficacy expectancies lead individuals to attribute success internally. Thus, causal ascriptions have the potential to influence behaviour both directly and indirectly via their influence on expectations (King, 1982; Kok *et al.*, 1992).

3.7.2.2. DISEASE THREAT EXPECTANCIES

Perceived severity, perceived susceptibility, symptoms and consequences

As can be seen in table 3.1 the majority of models include one or more measures of threat expectancies. However, the various models reviewed suggest a number of ways to conceptualise threat expectancies. For example, the HBM considers threat as a composite of perceived susceptibility to disease and perceived seriousness of disease. Leventhal's SRT includes ratings of symptoms and consequences of disease. Since under SRT the dimension illness 'identity' is measured with 'severity of symptom perception' there would appear to be a conceptual overlap with 'disease severity' as conceptualised in the HBM. Although, under the HBM perceived threat may be multidimensional and may include psychosocial functioning, more typically it focuses

on the medical consequences and severity of a disease such as pain and complications (Sheeran & Abraham, 1996). Similarly, the illness dimension 'consequences of disease' considers a broad category of disease consequence including the narrower concept of 'perceived susceptibility' as identified by the HBM. For example, in qualitative applications of SRT prompts are used which ask about: symptom severity; symptom disruption of activities and include short-term/long-term consequences (Leventhal & Nerenz, 1985).

In contrast under SCT perceptions of risk are considered situation-outcome expectancies and as such are implicitly assumed to refer to outcomes which occur as a consequence of the environment and are not afforded a specific significance (Schwarzer & Fuchs, 1996). Similarly, the TPB only includes threat expectancies under evaluations of behavioural outcomes and does not explicitly distinguish between threat expectancies and other outcome expectancies. However, although there is no theoretical reason why susceptibility and severity judgements cannot be subsumed under behavioural beliefs (Weinstein, 1993) several authors have argued to maintain the distinction between outcome expectancies and threat perceptions (Conner & Norman, 1996*a*; Abraham & Sheeran, 1997). For example, Cummings, Becker & Maile (1980) using Q sort and multidimensional scaling found that health threat variables formed clusters distinct from benefits and barriers and included. Health threat items formed two subcategories. Items referring to the perception and evaluation of symptoms (eg. importance and seriousness of symptoms, estimates of probable danger associated with symptoms, susceptibility to illness, severity of illness in terms of impact on life, impact of symptoms on functioning) were distinguishable from those pertaining to an individual's response to

illness (eg. tolerance of pain, tolerance of disability, willingness to adopt sick role). Health threat items were found to be distinguishable from disease knowledge which included both general knowledge about health and disease, and specific knowledge of etiology, symptoms, prognosis, identity and symptom recognition. This suggests that perceptions of consequences such as perception of illness and severity may be more similar than a general response towards coping with illness. Therefore, the idea that risk should remain distinct from other outcomes is corroborated by research indicating outcome expectancies often exist as a multidimensional construct (Bagozzi, 1981; Sutton, de Vries & Glanz, 1998).

Nevertheless several authors have suggested that perceived severity and susceptibility may influence attitudes and subjective norms implying that they are potentially distinct from action-outcome expectancies although they have not explicitly addressed their precise role (Fishbein & Middlestadt, 1989; Stasson & Fishbein, 1990). For example, Fishbein & Middlestadt (1989, p.107) suggests that susceptibility and severity are 'external' variables that 'may or may not have an effect on behaviour'. However, according to SCT, perceived threat as measured by situation-outcome expectancies are considered precursors of self-efficacy but not necessarily of action. Similarly, other theoretical models such as the health action process, postulate that threat beliefs (severity and vulnerability) underlie outcome expectancies and proceed them in temporal order (Schwarzer, 1992*a*). In contrast SRT does not provide any theoretical elaboration regarding the relationship between threat expectancies and other illness dimensions. The HBM, like Weinstein's (1988) precaution adoption process, suggests that a minimum level of risk perception is necessary as a precursor to action but once

a certain level of vulnerability has been reached perceived susceptibility has little impact on behaviour. Although, perceptions of risk may be particularly difficult to measure since individual's consistently underestimate own risk relative to others (eg. Weinstein, 1987), the modest role of risk appraisal as a determinant of future behaviour found in empirical research (van der Plight, 1996) suggests it may be a more distal behavioural antecedent ie. does not play a central role in behavioural prediction. Therefore, although the majority of decision-making models either explicitly or implicitly incorporate threat expectancies, differential predictions are made in terms of the impact of threat expectancies on behaviour. Overall, it would appear that threat expectancies may be best conceived as distal predictors of behaviour and to be mediated by evaluations of behavioural outcomes.

3.7.3. A SEPARATE MEDIATING VARIABLE

Behavioural motivation

Finally, most of the models posit or are consistent with, a separate mediating variable between beliefs and behaviour, specifically behavioural intentions or motivation. The TRA/TPB explicitly incorporates intentions as a mediator between beliefs and behaviours. Similarly, Bandura notes the importance of high motivation being unable to be translated into behaviour and includes intentions to account for circumstances beyond a person's control. Similarly, Leventhal acknowledges the role of motivation as a mediator of behaviour implicitly suggesting a temporal process but does not explicitly include intentions within the schematic representation of illness. Under the HBM intentions have been included as one of a number of motivating factors although

have not explicitly been given a mediating role. However, Weiner's ATHB does not explicitly include motivation as a separate determinate of action since the model largely deals with the antecedents of expectations rather than action control.

Nevertheless, the empirical research regarding the role of intention as a mediator of the attitude-behaviour relationship is convincingly robust (Bagozzi, 1981). The average intention-behaviour correlations range from .45 to .96 and explain on average 60% of the variance in behaviour (see meta-analysis' by Ajzen, 1988; Sheppard *et al.*, 1988; Randall & Wolff, 1994; Godin & Kok, 1996). However, intentions are not always the most proximal predictors of action particularly when dealing with behaviours which are repeated over time. Several studies have shown past behaviour to have an independent effect (ie effects that are not mediated) on both intentions and future behaviour (eg. Bagozzi, 1981) although none of the models reviewed explicitly incorporates habit or past experience as an explanatory variable.

3.8. TOWARDS AN INTEGRATED MODEL

The findings of this review are summarised in an integrated behavioural-decision model (see fig. 3.6 below).

The integrated model in fig. 3.6. includes motivations (ie. intentions); threat perceptions (ie. severity and susceptibility); action-outcome expectancies; attributions of disease onset; attributions for disease recovery and control expectancies encompassing both perceptions of control over own behaviour (self-efficacy) and estimates of task difficulty (perceived locus of control). Although, many of the paths between variables are unspecified by SCMs a temporal order was derived from current theory and empirical investigation. An integrated model facilitates understanding and discussion of commonalities and differences and provides a means with which to promote theory development through the testing of theoretical assumptions.

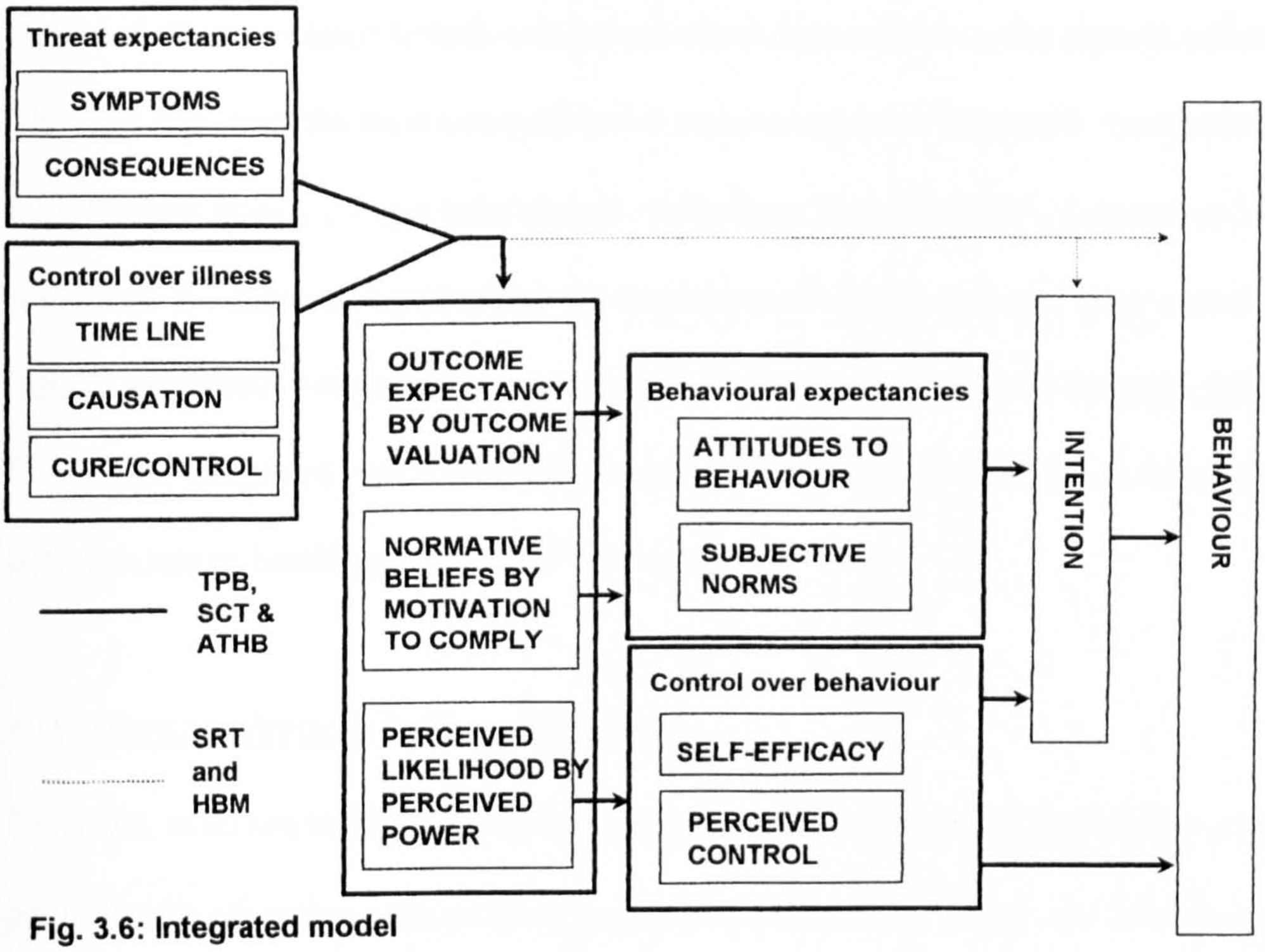

Fig. 3.6: Integrated model

3.9. CHAPTER CONCLUSIONS

Following definitions, operalisation and commentary specifying the main constructs in greater detail, an attempt was made to provide a conceptual integration of the main variables shown to be predictive of patients' health-related behaviour. The empirical evidence derived from applications of SCMs to patients' health-related behaviour reveals, (i) intentions are generally robust predictors of behaviour; (ii) self-efficacy is an important precursor of both intentions and action; (iii) that the TPB generally outperforms the TRA; (iv) that the TRA performs at a similar level to the HBM; and (v) that beliefs about disease threats appear less robust predictors of intentions and action than beliefs about behaviour. As applied to health professionals, two main representational schemas were distinguishable: the representation of own behaviour or treatment preference (ie. self-related beliefs) and the representation of illness that included disease-related beliefs and beliefs about recovery (ie. other-related beliefs). The TPB represents the most comprehensive representation of behaviour incorporating expectancies from SCT and behavioural evaluations from the HBM. In contrast SRT represents the most comprehensive representation of illness incorporating causes of disease and control over recovery from ATHB and threat expectancies from the HBM. Finally, an integrated model was proposed as a framework for studying the cognitive determinants of health professionals' behaviour.

3.10. IMPLICATIONS FOR RESEARCH

Therefore, as shown in chapter one the primary prevention of obesity has become a key public health objective with practice nurses positioned at the forefront of delivering weight management services. Nevertheless, as shown in chapter two the success rates

from primary care interventions for weight loss are low. Attention has focused on the role of health professionals' treatment decisions as a first step in understanding patient outcomes. Systematic variability in clinical practice revealed by a developing literature underscores the necessity for a full explication of provider decisions. However, research investigating the cognitive antecedents of variability in obesity treatment decisions has been non-systematic and relatively marginal. In contrast as shown in this chapter SCMs have been extensively applied and elaborated within the context of patient health-related behaviour. Therefore, while traditionally used to understand patient decisions SCMs have the potential to explain provider treatment behaviour. Using SCMs as a theoretical framework, health professionals' management of obesity can be understood in relation to both the representation of their own treatment behaviour (self-related beliefs) and the representation of patients' disease (other-related beliefs).

3.11. AIMS OF THESIS

Therefore, the aim of this thesis is to investigate practice nurses' management of obesity using a conceptual framework derived from an integration of existing SCMs that have previously been confined to investigating patients' health-related behaviour. Specifically, this thesis aims to explore the antecedents of practice nurses' obesity management decisions with a particular emphasis on examining:

- The relationship between self-related cognitions about own treatment behaviour and weight management decisions.

- The relationship between other-related cognitions about obesity and weight

management decisions.

- The degree of shared representation of the consultation process between patient and practice nurse.

3.12. MAIN HYPOTHESES

The general hypotheses for this thesis are as follows:

- It was hypothesised that beliefs about own treatment behaviour (ie. self-related cognitions) would be more proximal predictors of weight management decisions relative to beliefs about obesity (other-related cognitions).

- It was hypothesised that the degree of shared representation of the consultation process between patient and practice nurse would be related to consultation outcomes.

More specific hypotheses will be addressed within each separate study.

Chapter 4

STUDY 1: PRACTICES NURSES' BELIEFS ABOUT OBESITY AND THEIR WEIGHT MANAGEMENT BEHAVIOUR

4.1. ABSTRACT

The aim of the present study was to examine practice nurses' weight-related beliefs and behaviour and to investigate differences by body mass index (BMI). Practice nurses (N=586) completed a cross-sectional mailed questionnaire concerning the representation of obesity (causation, health consequences, time-line and control over solutions); behavioural expectancies (self-efficacy, perceived success and incentives) and current clinical practice. Although, practice nurses reported positive attitudes towards obesity and the potential for change, expectations for patient compliance and actual weight loss were moderately low. Practice nurses with a high BMI were more likely to advise patients to undertake a calorie controlled diet but less likely to advise them to eat less. Practice nurses with a high BMI attributed less blame to the patient for failed weight loss attempts but more blame to the inadequacy of current weight loss methods. Involvement in weight management correlated with behavioural expectancies but not with the representation of obesity. The results are discussed with regard to illness-cognitions, the belief-behaviour link and the role of personal health experience.

4.2. BACKGROUND TO STUDY

4.2.1. Control over obesity onset and recovery

Obesity develops as a consequence of an excess of energy intake over expenditure

particularly for those individuals with a genetic disposition towards weight gain: the main treatment for obesity involves dietary restriction and increased exercise (see chapter one). The causes attributed to the onset of illness are closely related to those attributed to recovery (Lau & Hartman, 1983). Based on an attributional model of helping behaviour (Weiner, 1985) causal ascriptions regarding the onset of disease and control over recovery are assumed to be related to expectations for successful help giving (see chapter three). Therefore, help giving is likely to be increased when the onset of disease is reversible and recovery controllable (Weiner, 1980; 1985). Attributions for the causes of depression to uncontrollable events have been shown to increase intentions to prescribe psychotropic medication (Brewin, 1984). However, if an individual is deemed responsible for the origins of a problem and its solution or maintenance the probability of helping will be reduced (Ickes & Kidd, 1976; Brickman *et al.*, 1982; Weiner, 1985). Observers evaluate actors more negatively when their obesity is attributed to a lack of self-control in comparison to thyroid problems (DeJong, 1980). Similarly, health professionals exhibit more negative attitudes towards 'unhealthy' patients who fail to undertake preventive health behaviour, rate their illnesses as more preventable, consider them as less compliant and rate them as more responsible for their health problems in comparison to their more health conscious counterparts (Marteau & Riordan, 1992; Ogden & Knight, 1995). In the only study to explore the relationship between GPs attributions for obesity onset and their treatment decisions causal beliefs were largely unrelated to counselling behaviour (Thomson *et al.*, 1993). Therefore, this study explicitly aims to investigate practice nurses' attributions of obesity, a physical health problem with a complex etiology and high rates of recidivism.

4.2.2. Optimistic self-beliefs

However, according to social cognition theory causal judgements regarding effort, task difficulty, success and failure serve as conveyers of efficacy information (Bandura, 1986). Deficient performance is unlikely to lower self-efficacy if failure is discounted on grounds of insufficient effort or adverse conditions. Therefore, research suggests attributions influence behaviour via their impact on behavioural expectancies (King, 1982; Kok *et al.*, 1992). For example, Schwarzer *et al.* (1992) found that observers' attributions regarding actors' efforts to cope with obesity influenced their expectations for success which in turn influenced their intentions to offer assistance. Similarly, research suggests that health professionals' beliefs about their own abilities and expectancies for patient outcomes may influence action. Research indicates high self-efficacious beliefs are associated with higher intentions to provide home care (Vermette & Godin, 1996) and to engage in counselling for sexual health (Millstein, 1996; Ngomuno *et al.*, 1996). Optimism regarding perceived success of aid has been shown to predict helping behaviour in the context of metal health (Dagnan, Trower & Smith, 1998; Sharrock *et al.*, 1990). High outcome expectancies following health promotion advice have been found to correlate with propensity to give healthy eating and weight control advice (Mullen & Holcomb, 1990). Self-efficacy has emerged as positively associated with weight management and dietary counselling (Mullen & Holcomb, 1990; Price *et al.*, 1987; Glanz *et al.*, 1995; Thomson *et al.*, 1993). However, no research has explored practice nurses' beliefs about obesity and their weight management practices.

4.2.3. The medical consequences of obesity

In addition to beliefs about causation and the controllability of disease progression, the

self-regulatory model (Leventhal *et al.*, 1984) and the health belief model (Becker *et al.*, 1977) both extend the representation of illness beyond the causal beliefs ascribed by the attributional model of helping to include beliefs about the consequences of disease. Perceptions of risk and ratings of disease prevalence have been found to provide an impetus for patients' own health protective actions (Janz & Becker, 1984). Accordingly research suggests that pediatricians' perceptions of disease seriousness and vulnerability to complications have been shown to influence their choice of treatment goals for childhood diabetes (Marteau & Baum, 1984). Moreover, health professionals' with high expectations for risk reduction following health promotion advice are more likely to report counselling patients about dietary change and weight control (Mullen & Holcomb, 1990). However, no research has investigated practice nurses' beliefs about the health risks associated with obesity.

4.2.4. The personal context of advice

Although the emphasis on health professionals' beliefs, represents a shift away from knowledge as the explanation of behaviour, this itself has been criticised for its focus on individual cognitions and the neglect of the surrounding context. In terms of weight management, practice nurses' beliefs and behaviour may be influenced by the context in which the weight loss advice takes place. In particular, this advice is located within the practice nurses personal experience of weight. In western societies being overweight carries social and psychological consequences and has been described as a social disability (Richardson, 1971; DeJong, 1980; 1993). Evidence exists for discrimination against obese individuals in education, occupational and medical settings (eg. Allon, 1982). Obese individuals are often subject to stereotyping, being described

as unattractive, unintelligent and lacking willpower (Rothblum, 1992; Lundberg & Sheehan, 1994). Despite recognition of the complex aetiology of obesity, blame for excess weight is often attributed directly to the obese individual (Brownell, 1991). Studies have documented negative attitudes among medical students (Blumberg & Mellis, 1985), physicians (Price, *et al.*, 1987, Price *et al.*, 1989) nutritionists (Maiman, Wang, Becker, Finlay & Simonson, 1979) and mental health professionals (Young & Powell, 1985).

4.2.5. Health professionals' personal health histories

Research suggests that illness representations differ as a function of both personal experience and personal relevance (Schiaffino & Cea, 1995) suggesting that practice nurses who are themselves overweight may hold different representation of obesity than their thinner counterparts. For example, Bishop (1991) investigated the role of personal relevance in the representation (causes, control over cure, seriousness) of a variety of illnesses. The results suggest that fewer concepts are employed in the representation of others' disease. Within the patient health-behaviour literature, personal experience with a health problem is often viewed as a prerequisite to perceptions of vulnerability (Weinstein, 1988; 1989). If as research suggests, health professionals' personal health history affects prevalence estimates of disease (Jemmott, Croyle & Ditto, 1988) it may also influence reactions to patients' complaints. For example, smoking doctors have been found to spend less time counselling about smoking than their non-smoking counterparts (Stokes & Rigotti, 1988). Practice nurses identified as 'irregularly active' are less likely to encourage their patients to exercise than their more active counterparts (McDowell *et al.*, 1997). Overweight mental health professionals are less critical of

obese clients, suggesting a relationship between health care professionals' own weight and their professional behaviour (Young & Powell, 1985). However, less compelling evidence has been found for the relationship between weight and the beliefs of primary care doctors (Price *et al.*, 1987): although, Price *et al.* (1987) found that overweight doctors were less likely to believe they should counsel patients about the health risks of obesity or maintain a normal weight themselves they were less likely to consider obesity a serious risk to health, these differences represented only eight items on a forty-item questionnaire. However, this study did not differentiate between males and females and although half of the sample of were female, more men 44% than women 29% were overweight. Therefore, the failure to find a significant difference between overweight/normal weight respondents may have been due to the existence of gender differences.

4.2.6. The role of gender

Research suggests that gender differences exist in societal attitudes towards ideal body shape: although slimness is the preferred body shape for women a more mesomorphic shape is the preferred body shape for men (Lamb, Jackson, Cassiday & Priest, 1993). In the media women are portrayed as underweight whilst men are portrayed as standard weight (Garner, Grafinkel, Schwartz & Thompson, 1980; Anderson & DiDomenico, 1992; Wiseman, Gray, Mosimann & Ahrens, 1992). Gender differences in societal attitudes are reflected in gender differences in body shape perceptions and weight-related behaviour. Women are less satisfied with their body shape than men and generally perceive themselves as being overweight (Fallon & Rozin, 1985). Men are less likely than women to either weigh themselves frequently or participate in weight

loss programmes (Dwyer, Feldman & Meyer, 1967): women whose weight is well within acceptable levels are trying to lose weight, while fewer men even those in the heaviest groups are actively pursuing weight control (Ogden, 1992). Therefore, women experience greater pressure to be thin than men and body weight tends to be more central to the core self-concept (Wadden, Brown, Foster & Linowitz, 1991). Accordingly, the present study also aimed to explore the beliefs and behaviour of a group of female health professionals (practice nurses) in relation to their own Body Mass Index (BMI).

4.3. AIMS

In summation, no studies have investigated weight management by practice nurses despite their leading role in health promotion. The present study aims to explore practice nurses' beliefs about obesity and their current weight management practices using constructs derived from SCMs (ie. the self-regulation model; the attributional theory of helping behaviour; the health belief model and social cognitive theory) and to locate these factors within the personal context in terms of practice nurses' own weight history.

4.4. METHODOLOGY

4.4.1. DESIGN

A cross-sectional postal questionnaire was used. The questionnaire was developed based on previous literature investigating the representation of illness (Turk *et al.*, 1986; Schiaffino & Cea, 1995; Weinman *et al.*, 1996), current developments in obesity

research (see chapter one) and informal discussions with practice nurses. A pilot study was conducted (n=15) to check that the questions were understandable to practice nurses. On the basis of comments received the questionnaire was amended.

4.4.2. PROCEDURE AND PARTICIPANTS

Ten family health service authorities (FHSA's) were randomly selected using the Directory of Health Services Authorities (1992) as a sampling frame. Participating FHSA's were as follows: Lambeth; Greenwich, Southwark & Lewisham; Bromley; Merton, Sutton & Wanstead; Cambridge; Northhampton; Doncaster; Somerset; North & Mid Hants; and Enfield. Using FHSA records, 900 practices were randomly selected and one named practice nurse was contacted from each practice. A structured questionnaire was mailed to the 900 practice nurses. Follow-up reminders were sent 6 and 8 weeks after the first mailing. The questionnaire was completed by 586 practice nurses. The response rate was 65%. All practice nurses were female. The mean age for practice nurses was 42.3yrs $\pm$ 8.41 range 23-70. Of these 91.8% were over 30 years old.

4.4.3. MEASURES

4.4.3.1. Occupational and personal profile characteristics

Occupational profile characteristics included the following: nursing qualifications, year of qualification, number of years in general practice, number of hours worked per week, whether they had received additional training in weight management and whether or not

they currently ran a weight loss clinic within their practice. Personal profile characteristics included the following: age, dieting status, weekly weight variability, height and weight (from which body mass index (BMI) was then calculated using the formula weight kg/height m^2).

4.4.3.2. Beliefs about obesity and its management

i) Beliefs about the causes of the onset of obesity

Causes of obesity onset were measured by asking practice nurses: '*to what extent do you agree that the following factors play a significant role in the development of obesity...*'. The following list of 16 different possible causes of obesity covering biological causes, eating behaviour, lifestyle and individual differences derived from the literature was provided: genetics, low metabolic rate, increased fat cell number, hormonal problems, excessive calorie intake, eating too much of the wrong type of foods, eating for comfort, binge eating; sedentary lifestyle, parental eating habits, availability of high fat foods, socioeconomic status, personality, lack of control, psychological problems and cultural differences. Responses were made on 7 point Likert scales and ranged from 'strongly disagree' (1) to 'strongly agree' (7).[18]

ii) Beliefs about the medical consequences of obesity

The medical consequences of obesity were assessed by asking practice nurses: '*in comparison to patients of average weight, what is the likelihood that obese patients will*

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[18] Due to an administrative error causes of obesity were only measured for 40% of the sample (N=223).

suffer from the following health problems in the future...'. A list of seven common weight related health problems were provided, three cardiovascular consequences (e.g. coronary heart disease, stroke, hypertension) and four non-cardiovascular consequences (eg. diabetes, psychological problems, joint trauma). Responses ranged from 'much below average' (1) to 'much above average' (7).

iii) Beliefs about the time-line of obesity

The chronicity and stability of obesity was measured by asking practice nurses to rate i) the preventability of obesity and ii) the treatability of obesity on seven point Likert scales. Responses ranged from 'not at all' (1) to 'extremely' (7).

iv) Beliefs about the control/cure over solutions to obesity

The causes of failed weight loss attempts were measured by asking practice nurses '*to what extent do you feel failure to lose weight is due to...*', a list of 4 possible reasons for why people may not lose weight was provided (e.g. lack of motivation, inadequacy of current weight loss methods, lack of support and noncompliance with weight loss advice).[19] Responses ranged from not at all (1) to completely (7).

v) Beliefs about the outcomes of giving weight loss advice

Beliefs about the expected outcomes of giving weight loss advice, included items covering response efficacy and incentives for advice giving and were measured by asking practice nurses to rate i) the likelihood patients would follow their advice, ii) the

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[19] According to Weiner (1985) within the achievement domain a relatively small number of causal ascriptions for success are salient (eg. ability, task difficulty, luck, effort, interest, others). The most dominant of these causes are ability and effort and are identical for attributions of failure.

likelihood if advice was followed patients would lose weight; iii) how successful they had been in bringing about weight loss in the last 6 months, iv) the benefits of weight loss to the patients health; v) the benefits to the patient of a healthy diet; vi) the seriousness to the patient of obesity, and iv) the seriousness to the patient of a poor diet. Responses ranged from 'not at all' (1) to 'completely' (7).

vi) Self-efficacy

Counselling self-efficacy was measured by asking practice nurses were asked to rate how confident they were at counselling patients about weight loss/dietary change. Responses ranged from 'not at all' (1) to 'completely' (7).

4.4.3.3. Reported behaviour

i) Involvement in giving advice

Involvement in giving advice was assessed by frequency of giving weight loss advice (less than once a week/once a week/more than once a week) and duration of weight loss advice sessions (less than 10 minutes/10 minutes /more than 10 minutes).

ii) Type of intervention

Practice nurses were asked how frequently they usually used a variety of weight loss interventions (e.g. calorie controlled diets (more than 1000 calories per day), very low calorie controlled diet (less than 1000 calories per day), general nutritional advice, referral to self-help group, exercise, eating less in general, surgery and drug therapy). Responses ranged from 'never' (1) to 'always' (7). Since over 90% of practice nurses

stated that they never offered medical interventions (ie. drug therapy or surgery) or very low calorie diets these variables were not analysed further.

iii) Identification of patients as overweight

Practice nurses were asked their BMI thresholds for intervention with both a healthy patient and a patient with a weight related health problem. BMI categories for both questions were as follows: 24-24.9 / 25-25.9 / 30-32.9 / 33-39.9 / 40-46 / 46+.

iv) Context for considering weight to be an issue

The context in which practice nurses considered intervention was measured by asking practice nurses to indicate *under what circumstances they usually consider weight to be an issue.* Responses were, when the patient mentions it, when a GP mentions it, when the patient has a weight related health problem, when the patient is overweight.

v) Assessment procedures

The way in which practice nurses assess patients obesity was measured by asking practice nurses to indicate whether or not they used BMI, weight charts or waist-to-hip ratio when assessing patients weight. Responses were yes or no. Since 100% of practice nurses reporting using BMI only this variable was not analysed further.

4.5. RESULTS

Data analysis

All data analysis was performed using SPSS. Prior to hypothesis testing the data were

screened for violations of the assumptions underlying parametric statistics (normality, outliers, homogeneity of variance) using the guidelines laid down by Tabachnick and Fidell (1989). Although a combination of grouped and ungrouped analysis was to be performed (eg. correlations and differences), since groups were non-experimental the decision was made to perform initial data screening on ungrouped data. Following data screening, data reduction comprised of principal components analysis. Reliability of measures were assessed using Cronbach's alpha. Profile characteristics and BMI were examined using descriptive statistics. Since the two BMI groups differed in terms of age, the main analysis comprised of one way ANCOVA's using age as a covariate. Finally, correlations between beliefs and behaviour were conducted using Pearson's r.

4.5.1. Preliminary data analysis

4.5.1.1. Data screening prior to main analysis

Fifteen percent of the sample had data missing on at least one variable. Investigation of missing data for randomness[20] revealed that on reported behavioural interventions missing data was non-random with respect to age: older subjects were significantly less likely to answer than their younger counterparts. However, since the amount of missing data was small (no one variable had more than 7.7 percent missing) and the strength of association (eta^2) between choice of intervention and age was low, ranging from .014 to .020 percent of the variance, the decision was made to replace missing values with

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[20] To assess randomness of missing data, dummy variables (0= missing, 1=non-missing) were created on variables with missing data. Key profile characteristics (e.g. BMI, age, number of hours worked, clinic status and training status) were then used as dependent variables. Where appropriate t-tests and Chi-square were performed. Significant differences were found on one variable (use of calorie controlled diets) by age using $p<.001$).

means.[21]

Normality was assessed using a combination of probability plots and descriptive statistics. A cutoff point of $<\pm 2$ for both skewness and kurtosis was used (George & Mallery, 1995). Results of evaluation of assumptions of normality revealed that normality was satisfactory for all variables except two behavioural measures (use of generalised dietary advice, and use of BMI thresholds) and four attitudinal measures: one attribution for failure item (patient non-compliance) and three causes of obesity items (excessive calorie intake, eating the wrong type of food and eating for comfort). Use of generalised dietary advice was transformed using reflect and inverse. This reduced the severe negative skewness from -3.06 to a more acceptable -1.68 and the large positive kurtosis from 11.02 to a more acceptable 1.11. Regarding use of BMI threshold, the moderate positive kurtosis was reduced from 2.87 (healthy threshold) and 3.82 (non-healthy threshold) to 1.33 and 1.78 using square root and logarithmic transformations respectively. Patient non-compliance was transformed using square root, reducing the slight positive kurtosis from 2.14 to a more acceptable .61. Concerning the causes of obesity, all three items were reversed and transformed using a logarithmic transformation[22]. This reduced the moderate positive kurtosis from 2.39 to -.59 for excessive calorie intake, from 2.39 to -.95 for eating the wrong type of food and from 3.59 to -.87 for eating for comfort. To facilitate interpretation of transformed

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[21] Although this procedure can be conservative, leading to deflated correlations as a result of reduced variance, since the amount of missing data was small, substantial loss of variance was not anticipated (Tabachnick & Fidell, 1989).

[22] Although the kurtosis was positive for all three items, they were also slightly negatively skewed (ranging from -1.35 to -1.59). The items were therefore reversed before transformation in order to prevent increasing the slight negative skewness.

variables, means are reported using the untransformed scale (Howell, 1982).

Search for univariate and multivariate outliers were performed by examination of boxplots and the calculation of *z*-scores using case number as a dummy independent variable in a multiple regression equation. Evaluation for significant univariate outliers employed *z*-scores greater than +/- 3.00. No variable had more than 1.4% of cases identifiable as significant univariate outliers. The only set of variables with univariate outliers were consequences of obesity (heart attack, stroke, hypertension and diabetes). Three multivariate outliers were found. Investigation of outliers employed a dummy variable (outliers = 1, non-outliers = 0) in a multiple regression analysis. Univariate outliers for risk of heart attack as a consequence of obesity held low perceptions of risk of stroke ($p<.0001$) while univariate outliers for risk of stroke, hypertension and diabetes as consequences of obesity held low perceptions of risk of heart attack ($p<.0001$). Multivariate outliers all had very negative attitudes towards the likelihood that patients would follow their advice ($p<.0001$). Outliers were replaced with a raw score one unit larger/smaller than the next most extreme score (Tabachnick & Fidell, 1989).

4.5.1.2. Data reduction and reliability

Principal component analysis with varimax rotation was undertaken as it was expected that the factors generated would be largely orthogonal (independent). Since groups were non-experimental and there was no reason to suspect a different factor structure, the decision was made to perform factor analysis on ungrouped data. Kaiser-Meyer-Olkin measure of sampling adequacy revealed that the distribution of values was

acceptable for conducting factor analysis (KMO = .72 to .81) and Barlett test of sphericity was significant ($p<.05$) revealing multivariate normality of the set of distributions unless otherwise stated. A factor loading of ≥.45 was chosen as a meaningful correlation representing 20% of overlapping variance and is considered fair (Tabachnick & Fidell, 1989). The results presented below are for separate factor analysis by set of beliefs. However, the same results were obtained using one large factor analysis.

i) Beliefs about the causes of the onset of obesity

Principal component analysis with varimax rotation was conducted on beliefs about the causes of obesity. Factor loadings are contained in table 4.1. In total 5 factors were generated with factor loadings ranging from 0.53 to 0.86 accounting for 60.2% of the total variance (see table 4.1 for factor loadings). A scree plot was used to ascertain the number of reliable factors present. Examination of the scree plot revealed that after the third factor the elbow was reached suggesting that three factors existed accounting for the majority of the variance (46%). Summation of the first three factors yielded Cronbach's alphas of 0.78, 0.63 and 0.67 respectively, suggesting that they formed three reliable measures. As suggested by the scree plot the remaining 2 factors did not form reliable measures, producing reliability coefficients of 0.44 and 0.55. The three reliable factors were labelled 'biological causes', 'lifestyle causes' and 'eating behaviour causes'. Biological causes comprised of 4 items (ie. genetics, fat cell number, hormonal problems, low metabolic rate), lifestyle causes comprised of 3 items (ie. sedentary lifestyle, availability of high fat foods, parental eating habits) and eating behaviour comprised of 3 items (ie. excessive calorie intake, eating too much of the wrong type

of foods, eating for comfort). The remaining six items (socioeconomic status, binge eating, personality, lack of control, cultural differences about size) were discarded from further analysis.

Table 4.1: Factor loadings for causes of obesity

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor labels	**Biological causes of obesity**	**Lifestyle causes of obesity**	**Eating behaviour causes of obesity**		
Genetics	.74				
Metabolism	.73				
Hormones	.86				
Fat cells	.72				
Availability of fatty food		.67			
Sedentary lifestyle		.74			
Parental eating habits		.74			
Eating too many calories			.76		
Eating the wrong food			.84		
Eating for comfort			.61		
Cultural beliefs				.60	
Personality				.75	
Lack of self-control					.69
Socioeconomic status					.78
Psychological problems					.53
Binge eating					
Cronbach's alpha coefficient	.78	.63	.67	.44.	.55

Note: only factor loadings greater than .45 are shown.

ii) Beliefs about the medical consequences of obesity

Principal component analysis with varimax rotation was conducted on beliefs about consequences of obesity. In total 2 factors were generated with factor loadings ranging from 0.65 to 0.89 accounting for 61.9% of the total variance (see table 4. 2 for factor loadings). A scree plot was used to ascertain the number of reliable factors present. Examination of the scree plot revealed that after the second factor the elbow was reached. The two factors were labelled 'cardiovascular' and 'non-cardiovascular' consequences. Cardiovascular consequences comprised of 3 items (ie. heart attack, stroke, hypertension) and non-cardiovascular consequences comprised of 4 items (ie. diabetes, psychological problems, cancer, joint trauma). Summation of the cardiovascular consequences and non-cardiovascular consequences yielded Cronbach's alphas of 0.81 and 0.70 respectively, suggesting that they formed two reliable measures.

Table 4.2: Factor loadings for consequences of obesity

	Factor 1	Factor 2
Factor labels	**Cardiovascular consequences**	**Non-cardiovascular consequences**
Heart attack	.87	
Stroke	.87	
Hypertension	.72	
Diabetes		.72
Joint trauma		.69
Certain cancers		.76
Psychological problems		.65
Cronbach's alpha coefficient	.81	.70

Note: only factor loadings greater than .45 are shown.

iii) Beliefs about the cure/control over solutions to obesity

Principal component analysis with varimax rotation was conducted on beliefs about the causes of failed weight loss attempts. Although Bartlett test of sphericity was significant ($p<.05$) revealing multivariate normality of the set of distributions (it is a sensitive test of the hypothesis that the correlations in the matrix are zero as it is dependent on *N*, Tabachnick & Fidell, 1989), the more sensitive Kaiser-Meyer-Olkin measure of sampling adequacy revealed that the distribution of values was unacceptable for conducting factor analysis (KMO = .49). A low KMO suggests the correlation matrix does not contain any sizable correlations (ie. $r=>.30$) and the decision was made to retain beliefs about failure as single measures only.

vi) Beliefs about the outcomes of advice

Principal component analysis with varimax rotation was conducted on beliefs about the solutions to obesity. In total 2 factors were generated with factor loadings ranging from 0.69 to 0.90 accounting for 64.3% of the total variance (see table 4.3 below for factor loadings). These were labelled 'perceived success' and 'incentives for intervention'. Perceived success comprised of 3 items (ie. likelihood patient will follow advice/lose weight and own success at bringing about weight loss) and incentives for intervention comprised of 4 items (ie. seriousness of a poor diet, benefits of a healthy diet, seriousness of obesity, benefits of weight loss). Examination of the scree plot revealed that after the second factor the elbow was reached. Summation of perceived success and incentives for intervention yielded Cronbach's alphas of 0.85 and 0.62 respectively, suggesting that they formed two reliable measures.

Table 4.3: Factor loadings for beliefs about the outcomes of advice

	Factor 1	Factor 2
Factor labels	**Perceived success**	**Incentives for intervention**
Likelihood patient will lose weight	.90	
Likelihood patient will follow advice	.87	
Successful weight loss	.86	
Seriousness of obesity		.68
Benefits of weight loss		.67
Seriousness of a poor diet		.76
Benefits of a good diet		.75
Cronbach's alpha coefficient	.85	.67

Note: only factor loadings greater than .45 are shown.

v) Time-line

The two controllability of obesity items were summed. Reliability analysis yielded a Cronbach's alpha of 0.72, suggesting that they formed a reliable measure.

vi) Self-efficacy

The operationalisation of self-efficacy in terms of confidence has been shown to produce a reliable measure with adequate test-retest reliability and high prospective predictive power (Schwarzer, 1992; Wulfert *et al.*, 1994).

vii) Type of intervention

Principal component analysis with varimax rotation was conducted on type of intervention used. Although Barlett test of sphericity was significant ($p<.05$) revealing multivariate normality of the set of distributions, the more sensitive Kaiser-Meyer-Olkin

measure of sampling adequacy revealed that the distribution of values was unacceptable for conducting factor analysis (KMO = .53). A low KMO suggests the correlation matrix does not contain any sizable correlations (ie. $r > .30$) and the decision was made to retain type of intervention as single measures only.

4.5.3. Profile characteristics of sample

i) Occupational profile characteristics

The mean year of qualification was 1975 ± 8.99 range 1936 - 1995, with 94.6% of the respondents being registered general nurses/state registered nurses and 5.4% state enrolled nurses. The range of post-registration qualifications included health visiting (3.4%); midwifery (22.5%) and district nursing (9.2%). The most frequently reported working week was 10-20 hours (37.7%) with 25.9% working more than 30 hours and only 3.6% working less than 10 hours. Only 12.3% of practice nurses had worked in general practice for more than 10 years, nearly half reported working in general practice for less than 5 years (49%). Weight loss clinics were run by 30% of the practice nurses surveyed, 76% of these reported having received some form of training in weight management as opposed to only 24% of practice nurses not running a clinic. The profile characteristics of the sample concord with those reported else where (Ross *et al.*, 1994).

ii) Practice nurses' BMI

The mean body mass index for the practice nurses was 23.48 (±3.43). In total, 24% of practice nurses were currently overweight (BMI > 24.9 and of these 5% were obese (BMI> 29.9). Subjects were subsequently divided into two groups on the basis of a

median split (median = 23.02). This resulted in two significantly different groups ($t(584) = -23.37, p < .0001$): the low BMI group had a mean BMI of 21.09 (sd. 1.32) representing an average normal weight while the high BMI group had a mean of 25.86 (sd. 3.02) representing an average overweight[23]. The high BMI group were more likely to restrain their eating ($t(584) = 7.70, p < .001$) and were more likely to report weight fluctuations ($t(584) = -4.90, p < .001$), suggesting that the use of a median split reliably discriminated between the two groups. Chi-square and t-tests were used to examine differences in profile characteristics by BMI. Significant differences between practice nurses with high/low BMI were found for age ($t(584) = -4.70, p < .001$) and year qualified ($t(584) = 3.51, p < .001$): practice nurses with higher BMI's were significantly older and obtained their nursing qualifications earlier than practice nurses with lower BMI's. Since year qualified and age were highly correlated only age was used as a covariate in all subsequent analysis. No other significant differences were found between practice nurses with high/low BMI on any of the other profile characteristics measured.

4.5.4. MAIN ANALYSIS

4.5.4.1. HYPOTHESES

- First, it was hypothesised that there would be a difference between practice nurses with a low BMI and those with a high BMI on: (i) beliefs about obesity (causes, control over cure, consequences), (ii) beliefs about its management

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[23] A median split was chosen since using tertiles resulted in two normal weight groups and one overweight group.

(self-efficacy and outcome expectancies), and (iii) weight management practices.

- Second. it was hypothesised that behaviour would be significantly correlated with (i) beliefs about obesity and (ii) beliefs about its management.

- Finally, it was hypothesised that the following beliefs would be significantly intercorrelated as follows:

  (i) control over cure would be correlated with self-efficacy and outcome expectancies;

  (ii) control over cure would be correlated with attributions for obesity onset;

  (iii) attributions for obesity onset would be correlated with self-efficacy and outcome expectancies; and

  (iv) consequences of obesity would be correlated with expected outcomes.

4.5.4.2. Beliefs about obesity

i) Beliefs about the causes and consequences of obesity

The means for the beliefs about obesity, split into subgroups separately by BMI are shown in table 4.4. The results reveal that practice nurses rated eating behaviour as the most important cause of obesity, followed by lifestyle factors, ratings of biological factors were generally neutral for both groups. Moreover, obesity was considered a serious threat to health with obese patients being considered more likely to suffer from both cardiovascular and non-cardiovascular illnesses, in comparison to average their

average weight counterparts. The results of one-way ANCOVA's revealed no significant differences on ratings of the causes or consequences of obesity by BMI.

Table 4.4: Beliefs about obesity broken down into subgroups by BMI

	Low BMI n= 293	High BMI n=293
Beliefs about causes and consequences of obesity		
Biological causes	4.26 (1.10)	4.19 (1.11)
Lifestyle causes	5.52 (0.77)	5.60 (0.82)
Eating causes	6.19 (0.65)	6.19 (0.64)
Cardiovascular consequences	6.02 (0.79)	5.90 (085)
Non-cardiovascular consequences	5.23 (0.88)	5.15 (0.92)
Beliefs about control over solutions to obesity		
Time-line	5.12 (0.86)	5.05 (0.92)
Lack of motivation	4.17 (1.46)	3.83 (1.59)*
Non-compliance	5.55 (0.97)	5.43 (1.06)
Lack of support	4.36 (1.35)	4.18 (1.54)
Inadequate methods	3.69 (1.56)	4.00 (1.52)*
Self-efficacy and expected outcomes		
Self-efficacy	4.89 (1.04)	4.99 (1.09)
Perceived success	3.91 (0.98)	4.05 (1.03)
Incentives for intervention	6.20 (0.57)	6.15 (0.59)

Note: * = $p<.05$.

ii) Beliefs about cure/control over the solutions to obesity

Examination of the means suggest that practice nurses were optimistic about the solutions to obesity and were positive towards the potential for change, attributing failed weight loss attempts to internal controllable patient characteristics. Overall, patient

non-compliance with advice was rated as the most likely reason for weight loss failure and the inadequacy of current methods as the least likely explanation. After adjusting for age one-way ANCOVA's revealed a significant difference on causes of failed weight loss attempts by practice nurses BMI: practice nurses with a high BMI were significantly less likely to consider failed weight loss attempts to be due to patient lack of motivation (F [2:583]=7.01: $p<.05$) and more likely to consider failed weight loss attempts to be due to inadequate weight loss methods (F [2:583] =6.69: $p<.05$) in comparison to the low BMI group. No significant differences were found for solutions to obesity by BMI.

iii) Self-efficacy and beliefs about the outcomes of weight loss advice

As can be seen in table 4.4, overall the means suggest that practice nurses were confident in giving weight loss advice, considered weight loss as beneficial to the patient but were not particularly optimistic about the actual outcomes of weight management advice. Perceptions of success were given a neutral rating around the midpoint of the scale. The results of one-way ANCOVA's revealed no significant differences on ratings of self-efficacy, incentives or perceived success by BMI.

4.5.4.3. Reported behaviour

The means for behaviour, broken down separately by BMI are shown in table 4.5.

Table 4.5: Weight management behaviour broken down into subgroups by BMI

	Low BMI n= 293	High BMI n=293
Mean involvement in weight management		
Frequency of giving advice	2.55 (0.64)	2.59 (0.60)
Time spent counselling patients	2.45 (0.64)	2.42 (0.66)
Mean type of intervention offered		
General nutrition	6.77 (0.60)	6.74 (0.56)*
Eat less	4.85 (1.88)	4.65 (2.01)*
Calorie controlled diet	2.95 (1.83)	3.39 (2.04)
Exercise	4.91 (1.71)	4.72 (1.93)
Refer	3.46 (1.55)	3.65 (1.66)
BMI threshold for intervention with a healthy patient		
BMI 24 - 24.9	3.8%	3.1%
BMI 25 - 29.9	58.6%	57.8%
BMI 30 - 32.9	35.3%	32.7%
BMI > 32.9	2.4%	6.5%
BMI threshold for a patient with a weight-related health problem		
BMI 24 - 24.9	13.0%	11.9%
BMI 25 - 29.9	76.0%	77.0%
BMI 30 - 32.9	10.6%	8.8%
BMI > 32.9	0.3%	2.0%
Context in which weight is considered an issue		
Patient asks	14.4%	16.8%
Patients weight	42.0%	29.7%*
Patients health	39.6%	48.3%
Recommendation by GP	4.0%	5.2%

Note: * = $p<.05$

i) Type of intervention

As shown in table 4.5., the means reveal that practice nurses reported almost always

offering general nutritional advice and exercise when giving weight loss advice. Advising patients to eat less in general and referrals to a self-help group were on average, offered sometimes, while calorie controlled diets were rated as used infrequently. After adjusting for age one-way ANCOVA revealed a significant difference on type of intervention used by practice nurses BMI: practice nurses with a higher BMI were significantly less likely to advise patients to eat less in general ($F[1:583] = 4.53$, $p<.05$), but more likely to advise patients to undertake a calorie controlled diet ($F[1:583] = 9.40$, $p<.05$) in comparison to the low BMI group. There were no other significant differences by practice nurses BMI on the other interventions offered.

ii) Involvement in giving advice

Overall, the majority of practice nurses reported giving advice more than once a week but most spent 10 minutes or less discussing weight loss. The results of one-way ANCOVA's revealed no significant differences for involvement in giving advice by practice nurses BMI.

iii) Context

The most frequently cited reason for offering weight loss advice was the patients health (43.8%) followed by the patients weight (36.1%), the patients suggestion (15.6%) and advice by a GP (4.6%). Practice nurses with a high BMI were significantly less likely to consider weight an issue based on the patients weight alone in comparison to practice nurses with a low BMI (χ^2 [df=3] = 7.89; $p<.05$).

iv) Threshold for intervention

The majority of practice nurses reported offering weight loss advice to both healthy and unhealthy patients at a BMI of 25 - 29.9 (or grade 1 obesity). Nevertheless, 38% of all practice nurses would not offer advice to a healthy patient (11% to a patient with a weight-related health problem) unless the patient had a BMI >.30. However, there were no significant differences between practice nurses with a high BMI and those with a low BMI for identification of either healthy (χ^2 [df=3] = 5.98; p>.05) or unhealthy patients (χ^2 [df=3] = 4.18; p>.05).

4.5.3. Intercorrelations between beliefs

Correlations between behavioural expectancies about weight management and the representation of obesity are shown in table 4.6 below. The results reveal that higher self-efficacious beliefs were positively associated with increased expectations of success (r=.45, p<.001), control over time-line (r=.14, p<.01) and attributions of failure to patient non-compliance (r=.19, p<.01) but negatively correlated with attributions of failure to inadequate weight loss methods (r=-.10, p<.05). Moreover, greater perceived incentives to give weight control advice in terms of benefits to patients of weight loss, were positively correlated with attributions for obesity onset to eating (r=.15, p<.05) and lifestyle (r=.29, p<.01), cardiovascular (r=.31, p<.01) and non-cardiovascular (r=.20, p<.01) health consequences, control over time-line (r=.36, p<.01), attributions of failure to patient non-compliance (r=.12, p<.05) and lack of support (r=.29, p<.01). Attributions to biology for obesity onset were positively associated with cardiovascular health consequences (r=.18, p<.01), negatively associated with attributions of failure

from patients lack of motivation (r=-.14, p<.05), non-compliance (r=-.15, p<.05) and lack of support (r=-.17, p<.05) but positively correlated with attributions for failure to the inadequacy of current weight loss methods (r=.15, p<.05).

Table 4.6: Correlations between behavioural-beliefs and illness-cognitions

	ES	EB	CB	CE	CL	RC	RN	TL	FC	FI	FM	FS
Self-efficacy (SE)	.45 ***	-	-	.11	.11	-	-	.14 **	.19 **	-.10 *	-	-
Expected success (ES)		-	-	-	-	-	-	.13 **	-	-.10 *	-	.11
Expected benefit (EB)			-	.15 *	.29 **	.31 **	.20 **	.36 **	.12 **	-	-	29 **
Caused by biology (CB)				-	.15 *	.18 **	-	-	-.15 *	.15 *	-.14 *	-.17 *
Caused by eating (CE)					.39 **	-	.11	-	-	-	-	-
Caused by lifestyle (CL)						.22 **	.27 **	-	-	-	-	.11
Cardiovascular risk (RC)							.51 ***	.23 **	-	-	-	-
Non-cardio risk (RN)								.12 **	-	-	.11	.15 *
Time-line (TL)									.19 **	-	.11	-
Failure as non-comply (FC)										-	.23 **	-
Failure as inadequate (FI)											-	.15 *
Failure as motivation (FM)												.22 **
Failure as no support (FS)												

* p<.05 ** p<.01*** p<.001 correlations <.10 are not shown. *Note*: All available readings were included for each correlation and the degrees of freedom therefore vary.

4.5.4. Correlations between beliefs and behaviour

i) Involvement in weight management and intervention thresholds

The correlations between beliefs about obesity and involvement in weight management are shown in table 4.7.

Table 4.7: Correlations between involvement in weight management, intervention thresholds and beliefs about obesity.

	Frequency of giving advice	Time spent giving advice	Threshold for intervention (healthy)	Threshold for intervention (with health problem)
Self-efficacy and expected outcomes				
Self-efficacy	.28***	.15***		
Expected outcomes	.22***	.20***		
Incentive for intervention			-.17***	
Beliefs about causes and consequences of obesity				
Biological				
Lifestyle				
Eating				
Cardiovascular				
Non-cardiovascular				
Beliefs about control over solutions to obesity				
Time-line				
Inadequate methods				
Lack of motivation				
Lack of support				
Non-compliance				

* $p<.05$ ** $p<.01$*** $p<.001$ correlations <.10 are not shown.

As can be seen in table 4.7, significant positive correlations emerged between self-efficacy and involvement in weight management: frequency of weight management and time spent engaged in counselling patients about weight loss correlated with self-efficacy (r =.28 and .15 respectively, p<.001). Significant positive correlations were also found between beliefs about expected outcomes and involvement in weight management: frequency of weight management and time spent engaged in counselling patients about weight loss correlated with expected outcomes (r=.22 and .20 respectively, p<.001). However, there were no other significant correlations between involvement in weight management and beliefs about the causes of obesity, medical consequences of obesity, solutions to obesity or failed weight loss attempts. The belief in the benefits to patients of weight loss were negatively correlated with the intervention threshold (r =-.17, p<.001). However, there were no other significant correlations between intervention threshold for a healthy patient and beliefs about the causes of obesity, medical consequences of obesity or causes of failed weight loss attempts. Moreover, there were no significant correlations between the intervention threshold used for a patient with a weight related health problem and any of the belief-based measures investigated.

ii) Type of interventions used

The correlations between beliefs about obesity and type of intervention used are shown in table 4.8.

Table 4.8: Correlations between beliefs and type of intervention used

	Nutritional advice	Eat less	Calorie controlled diet	Exercise	Referral
Self-efficacy and expected outcomes					
Self-efficacy	.14***	.10*			
Perceived success			.14***		-.11**
Benefits				.16***	
Beliefs about causes and consequences of obesity					
Biological					
Lifestyle	.15*			.22**	
Eating	.17***				
Cardiovascular				.14**	
Non-cardiovascular	.15***				
Beliefs about solutions to obesity					
Time-line					
Inadequate methods					.13**
Lack of motivation			.16***		
Lack of support		.16***			
Non-compliance					

* p<.05 ** p<.01*** p<.001 correlations <.10 are not shown.

As can be seen in table 4.8, self-efficacy significantly positively correlated with giving generalised nutritional advice (r=.14, p<.001) and advising patients to restrict their food intake (r =.10, p<.05). Expected outcomes in terms of perceived success significantly positively correlated with calorie controlled diets (r=.14, p<.001) but negatively correlated with referral to self-help group (r=-.11, p<.01). Regarding beliefs about the causes of obesity, there was a significant positive correlation between beliefs about lifestyle and eating behaviour as causes of obesity and offering patients generalised

nutritional advice (r=.15 and .17 respectively, p<.01). Beliefs about lifestyle correlated with advising patients to undertake exercise (r=.22, p<.001). Beliefs about the cardiovascular consequences of obesity were positively correlated with advising patients to undertake an exercise program (r=.14, p<.01), while beliefs about non-cardiovascular consequences were positively correlated with offering patients generalised nutritional advice (r=.15, p<.001). The belief that failed weight loss attempts were due to lack of support positively correlated with advising patients to eat less in general (r=.16, p<.001); lack of motivation with calorie controlled diets (r=.16, p<.001) and inadequate methods with referral (r=.13, p<.01). There were no other significant correlations between beliefs and behaviour.

4.6. DISCUSSION

The aim of the present study was to explore practice nurses' beliefs about obesity and their weight management behaviours and to investigate the role of practice nurses' own personal health history in the form of BMI. As a professional group practice nurses were confident that they had the necessary skills to give weight loss advice, rated obesity as serious but treatable, considered eating behaviour to be the main cause of obesity and held a positive attitude towards the health benefits of weight loss. This suggests practice nurses as a group, regard obesity as a problem worthy of intervention and management both for its health consequences if untreated and health benefits if treatment is successful. Treatment mainly consisted of giving generalised nutritional advice and advising patients to undertake exercise. However, as a group practice nurses were pessimistic about the outcomes of giving weight loss advice and failure to lose

weight was largely considered due to patients' non-compliance. Despite positive attitudes involvement in weight management was low: with over a third of practice nurses reporting giving weight loss advice once a week or less; over half reporting spending ten minutes or less discussing weight loss and only a third considered obesity to be an issue based on the patients' weight alone.

4.6.1. The role of BMI

In terms of differences by BMI, the results revealed that practice nurses with a high BMI were less likely to blame the patient for failed weight loss attempts and more likely to blame inadequate wight loss methods in comparison to the low BMI group. Moreover, practice nurses with a higher BMI were significantly less likely to advise patients to eat less in general; more likely to advise patients to undertake a calorie controlled diet and were less likely to raise the issue of weight loss on the basis of weight alone in comparison to the low BMI group. This finding supports previous research that suggests that a relationship exists between health professionals' own health behaviour and their health promotion practices (eg. Stokes & Rigotti, 1988). However, contrary to expectations there were no differences in involvement in weight management (frequency and duration), threshold for intervention, beliefs about causes of obesity, consequences of obesity, solutions to obesity, self-efficacy or expected outcomes of advice by BMI.

A possible reason for null results obtained by BMI in relation to the other measures investigated may be due to the way the two groups were devised. Although, a median split was used to separate practice nurses into high/low BMI, the median point was

below the cut off point for overweight (BMI <24.9). However, this explanation seems unlikely since the median split resulted in a normal weight group (with a mean BMI of 22) and an overweight group (with a mean BMI of 27.0) and differed significantly in terms of reported weekly weight variability and dieting status. A second possible reason for the null results obtained may be related to the sample itself: as a group the practice nurse sample had a lower percentage of overweight/obesity than would be expected in the general population (Department of Health, 1992*b*). Therefore, the response rate of 65% may have resulted in an unrepresentative sample in relation to distribution of weight (ie. practice nurses who were more overweight may not have completed a questionnaire). However, examination of the profile characteristics obtained (eg. demographic, occupational and educational information) suggest that the profile of the sample accords with those reported by other researchers (Ross *et al.*, 1994) suggesting that the sample were reasonably representative of practice nurses as a whole.

A second possible explanation for the null results obtained by BMI is suggested by the pattern of findings: differential effects were found according to types of measures. Examination of the pattern of differences reveals that differences were found for causes of failure to lose weight and types of intervention offered. Such measures may reflect personal experience with attempted weight loss whereas beliefs about obesity (eg. causes, consequences and solutions) and weight management (eg. self-efficacy, expected outcomes) where differences were not found, may be less likely to be influenced by personal experience. Since even those who are underweight may be bothered by their weight as shown by the number of underweight women who seek weight loss advice, it seems reasonable to suppose that the extent to which weight is

central to one's core identity may have been a more salient factor in relation to beliefs and behaviour as opposed to absolute weight. Research suggests that body weight schemas are independent of body weight and that although all individuals exhibit a self-related body weight schema, only those with a highly developed schema show selective processing in schema relevant domains (Markus, Hamill & Sentis, 1987). Moreover, recently self-identity labels have emerged as important predictors of decisions and behaviours in other areas of attitude research (eg. Biddle *et al.*, 1987; Chang *et al.*, 1988; Sparks & Shepherd, 1992) suggesting that self-identity as 'someone concerned about weight' may be a more salient than weight *per se*.

4.6.2. The interrelationship between beliefs

Attributions that imply controllability or instability suggest that a person can satisfy their goals through own efforts and should therefore be beneficial in creating expectations for success and facilitate helping behaviour. The results of this study suggest that practice nurses as 'observers' were more likely to attribute the causes of obesity to internal controllable factors (ie. eating and lifestyle) and were more likely to blame the patient for failing to lose weight (motivation and noncompliance) than attributing failure to external factors (inadequate methods and lack of support). The results are in accordance with previous research suggesting health care providers are more likely to rate patients as having less personal control over positive outcomes (placing greater emphasise on chance) in comparison to ratings made by patients (Gamsu & Bradley, 1987) and are more likely to attribute blame to the patient (Marteau & Johnston, 1986). This finding is consistent with previous research on characteristic attributional processes in clinical and non-clinical patient populations (eg. Jeffrey,

French & Schmid, 1990; Fiske & Taylor, 1991).

The results can be understood in the context of attribution theory that suggests that in explaining behaviours and their outcomes individuals are subject to cognitive biases. Systematic distortions include (i) the actor-observer bias whereby actors are more likely to attribute outcomes to external factors while observers are more likely to attribute outcomes to the disposition of the actor and (ii) the fundamental attribution error in which past successes are attributed to internal factors and failures to external factors (Fiske & Taylor, 1991; Kelley & Michela, 1980). Attributional biases have obvious functional implications since they influence the self-blame and perceptions of control over outcomes (eg. Ogden & Wardle, 1990; Weiner, 1980). Hence, practice nurses who were more optimistic about outcomes (eg. perceived success and benefits to patients) were more likely to rate obesity as less chronic and more likely to rate failure as a consequence of patient non-compliance and lack of support. However, although attributions of onset of obesity to biological causes were related to attributions for recovery, the correlations were weak. This finding can be contrasted with the study by Schwarzer *et al.* (1992) who reported interrelationships between a target person's coping efforts (ie. comply with advice) and controllability for the onset of obesity (ie. biological vs lifestyle onset). In contrast to the present study exploring naturally occurring representations, the latter study manipulated controllability of onset and recovery. The different results may therefore be a product of the extent to which participants inferred intentionality and hence ascribed blame to attributions of causation and recovery (White, 1991).

4.6.3. The interrelationship between beliefs and behaviour

Furthermore, despite reporting favourable attitudes towards the provision of weight management, there was mixed evidence regarding the relationship between attitudes and rates of reported behaviour: only 18 out of 117 correlations between the beliefs measured and reported behaviours were significant and those that were significant were generally low. Overall, there was evidence that intervention choice was influenced by the representation of obesity with lifestyle and eating causes being positively related to nutritional advice. Optimistic self-beliefs (self-efficacy and perceived success) correlated moderately with involvement with weight management. This pattern of findings concords with those obtained in other studies of health promotion activities where beliefs about self-efficacy and outcome expectancies have emerged as the most prominent correlates of medical practice (Thomson *et al.*, 1993; Mullen & Holcomb, 1990; Solberg, *et al.*, 1997). Both of these sets of beliefs represent beliefs about behaviour: the belief that one can perform the behaviour and the belief that if one does a desirable outcome will occur.

4.6.4. Methodological issues

However, there are several methodological weaknesses that may have led to deflated correlations between beliefs and behaviour. Firstly, since a cross-sectional design was employed, current attitudes may have been reported whereas assessments of behaviour may have been based on earlier beliefs. However, since the SRM, the HBM and the AMHB do not explicitly differentiate between past, current or future beliefs, cross-sectional analysis between cognitions and behaviour are consistent with theoretic predictions. Moreover, some authors argue that using self-report past behaviour over

a short time frame (ie. 3-months) as the best estimate of future behaviour in causal modelling is justifiable in the light of research documenting substantial longitudinal consistency in behaviour (Wulfert *et al.*, 1996). For example, Epstein (1979) showed many behaviours can be predicted with correlations in the .80s and higher if aggregated over enough occurrences. A second possible explanation for the null results relates to the reliability of measures employed. The use of only single items of weight management behaviour and the reliance on self-report may have served to deflate correlations. However, similar results have been reported within the patient health behaviour. For example, Jeffrey *et al.* (1990) report null results between attributions and adherence and fail to support the hypothesis that attributions and self-appraisals have prognostic significance in self control in dietary change. Moreover, research work by Cameron (1997) suggests that although vulnerability beliefs directly related to beliefs about social influence and perceived consequences, their expected associations with perceived barriers were not significant.

4.6.5. Theoretical issues

However, while methodological consideration may serve to reduce correlations, the results concord with attitude theories of decision-making that posit that beliefs about behaviour are central to self-regulation (eg. the attributional theory of helping behaviour, 1985; the theory of planned behaviour, Ajzen, 1991; and social learning theory, Bandura, 1977; see chapter 3). Research within the patient health arena suggests that intentions are important mediators of the relationship between beliefs and behaviour (eg. Godin & Kok, 1992). This suggests that beliefs about obesity may nevertheless be related to behaviour via their influence on behavioural intentions.

Therefore, the relationship between different types of beliefs (eg. illness-related beliefs) and beliefs about the behaviour (ie. self-related beliefs) and their relationship with practice patterns requires further elaboration. Therefore, null results may have been a consequence of failure to include a measure of intention or as a consequence of beliefs about behaviour being the more proximal predictor of action than beliefs about disease.

4.7. CONCLUSIONS

To conclude, practice nurses are responsible for the majority of weight related interventions in primary care. The results of the present study suggest that as a professional group variation exists regarding the beliefs and behaviours of practice nurses. Mixed results were obtained for BMI as a measure of personal health history: beliefs about causes of failed weight loss attempts and types of interventions chosen varied according to BMI, suggesting that personal relevance may provide insights into the variation in beliefs and practices of health professionals. Some support was obtained for the relationship between health professionals beliefs and their behaviour: practice rates were related primarily to optimistic beliefs about the behaviour (self-efficacy and outcome expectancies) while choice of intervention was related to evaluations of both behaviour and disease (ie. the causes and consequences of obesity). However, null results may have been a consequence of either failure to include a measure of intention or as a consequence of beliefs about behaviour being the more proximal predictor of action than beliefs about disease. Since, the effectiveness of interventions for obesity at the level of primary care remains low further research is required to fully explain the relationship between the representation of disease, the representations of behaviour and the decisions made by health care providers.

4.8. CONCLUDING REMARKS

The results of this study revealed mixed support for the role of BMI in understanding practice nurses' weight management. However, since body weight is independent of body concern, the influence of BMI may be mediated by self-identity labels and will therefore be examined further in study three. The results of this study also suggest beliefs about obesity were poor correlates of weight management decisions in comparison to behavioural expectancies. However, behavioural intentions have emerged as important meditators of the attitude-behaviour relationship in other areas of decision-making (see chapter three). Therefore, the next study will examine the relationship between practice nurses' representation of both treatment and disease in predicting behavioural intentions using an integration of the theories of self-regulation and planned behaviour.

Chapter 5

STUDY2: PREDICTING HEALTH PROFESSIONALS' DECISIONS: A COMPARISON OF THE THEORIES OF PLANNED BEHAVIOUR AND SELF-REGULATION FOR UNDERSTANDING INTENTIONS

5.1. ABSTRACT

The aim of the present study was to examine practice nurses' decisions to raise the issue of weight loss with overweight patients and to compare the predictive power of the self-regulation model (SRM) to the theories of planned behaviour/reasoned action (TPB/TRA). Practice nurses (N=102) completed a cross-sectional mailed questionnaire about their attitudes to raising the issue of weight loss and their beliefs about obesity. The TPB (with PBC conceptualised as self-efficacy) explained significantly more variance in behavioural intentions than the TRA. Moreover, the effects of the beliefs contained in the SRM were fully mediated by the TPB variables. After controlling for SRT and the TPB constructs, past behaviour emerged as an independent predictor of intentions, particularly for those practice nurses for whom control over raising the issue was high. The results are discussed with reference to theoretical and practical implications with a particular focus on the relationship between illness-related, self-related and other-related cognitions.

5.2. BACKGROUND TO STUDY

Research suggests that the extent to which counselling about behavioural risk factors such as obesity is undertaken in general practice may be less than optimal (see chapter

two for a full discussion). A number of clinical behaviours may provide a potential avenue from which to improve service provision and patient health outcomes including: whether the patients weight is measured; whether they are identified as overweight; whether the issue of weight and weight loss is raised; whether advice is given; what type of treatment is offered and whether treatment is appropriate and effective. Raising the issue of weight loss provides a particularly fruitful avenue of research since it requires identification of the patient as overweight and may form a therapeutic intervention itself: raising the issue may act as a cue to action (Janz & Becker, 1984) and a potential initiator of movement through the change process (DiClemente & Prochaska, 1985).

5.2.1. Previous research

Research suggests that patients' health related behaviours can be understood both with reference to beliefs about disease and beliefs about behaviour (see chapter three). Accordingly, research investigating health professionals' work-related behaviour, suggests that beliefs about both disease (eg. Brewin, 1984; Marteau & Baum, 1984; Gillespie & Bradley, 1988; Sharrock *et al.*, 1990) and behaviour (eg. Nash *et al.*, 1993; Ngomuno *et al.*, 1995; Millstein, 1996; Bunce & Birdi, 1998) can be used to understand and predict the performance of a variety of clinical procedures. Nevertheless, the relationship between beliefs contingent on the mental representation of illness and those contingent on the mental representation of behaviour has rarely been investigated. In general the research investigating health professionals' beliefs about obesity are sparse. In the few empirical studies that have attempted to relate health professionals' beliefs about prevention to indices of behaviour, support for attitudinal predictors of action has been mixed. For example, research suggests that beliefs about obesity such as

attributions of causation are largely unrelated to counselling behaviour (Thomson *et al.*, 1993). Similarly, attitudinal factors relating to health promotion appear unimportant in explaining weight management practice (Kushner, 1995; Solberg *et al.*, 1997; Heywood *et al.*, 1996). More specific beliefs consequent on behaviour such as outcome expectancies following health promotion advice have been found to correlate with diet/weight loss counselling (Mullen & Holcomb, 1990). In addition, self-efficacy has consistently emerged as positively associated with weight management and dietary counselling (Mullen & Holcomb, 1990; Price *et al.*, 1987; Glanz *et al.*, 1995; Thomson *et al.*, 1993). However, although these studies have identified several influential factors in the provision of obesity management services, few attempts have been made to examine multivariate influences on health professionals' decision making using structured models.

5.2.2. Theories of reasoned action and planned behaviour (TRA/TPB)

The most comprehensive models for the representation of behaviour are the theories of reasoned action (Fishbein & Ajzen, 1975) and planned behaviour (Ajzen, 1991, see chapter three). According to the TRA, behaviour is determined by intentions; intentions are determined by attitudes and subjective norms. The TRA is assumed to provide an adequate explanation of behaviour providing action is not impeded by a lack of control over performance. In such situations the TPB extends the TRA by proposing that intentions and behaviour are also influenced by a third variable, namely perceived behavioural control (PBC). Underpinning these direct measures are corresponding sets of beliefs.

5.2.3. Raising the issue as planned non-volitional behaviour

Both the TRA and the more recent TPB have successfully predicted a variety of patient health-related behaviours (Godin & Kok, 1996). Since many behaviours can be considered impeded by a lack of control over performance, the TPB has generally outperformed the TRA in empirical comparisons within the patient health behaviour literature (eg. Brubaker & Wickersham, 1990). In a recent meta-analysis the average intention-perceived behavioural control correlation was reported as .46 explaining on average 13% of the variance in intentions and a further 11% in behaviour (Godin & Kok, 1996). Similarly, in work contexts the TPB has performed better than the TRA (Fishbein & Stasson, 1990). However, only two studies have used the TPB to predict work-related behaviours among health professionals (Millstein, 1997; Bunce & Birdi, 1998) and none have investigated practice nurses' weight management behaviours. In situations of high control the TPB reverts to the TRA and PBC is not expected to add to the prediction of behavioural decisions.

5.2.4. Perceived control versus self-efficacy

Moreover, PBC is defined as the individuals perception of ease of performing the behaviour and is intended as a proxy measure of the factors that may influence performance (Ajzen, 1988, p. 134). Therefore, it has been variously operationalised as a combination of measures of control over action and perceptions of ability, ease or confidence in performance (Ajzen, 1991; Ajzen, 1988; Ajzen & Madden, 1986; see chapter three). By explicitly including notions of controllability of action, PBC is broader than Bandura's (1977) concept of self-efficacy or the person's appraisal of their ability to perform the behaviour. Three lines of evidence have supported the theoretical

proposition that perceptions of control are distinct from estimates of self-efficacy. First, researchers have reported problems constructing reliable scales combining measures of perceived control and perceptions of ease suggesting that perceptions of control are multidimensional (eg. Sparks & Shepherd, 1992; Sparks, 1994; Sutton *et al.*, 1998). Second, perceived control and self-efficacy have been found to be from two distinct factors (Terry, 1993; White, Terry, & Hogg, 1994). Third, self-efficacy and perceived control have been found to have different antecedents and to be differentially predictive of intentions and behaviour (Terry & O'Leary, 1995). Therefore, research is supportive of the supposition that self-efficacy and perceived control represent conceptually distinct concepts (Norman & Conner, 1996; Conner & Armitage, 1998). However, the potential multidimensional representation of the PBC construct has not been explored in relation to practice nurses.

5.2.5. The role of past behaviour

Furthermore, contra to the TRA, early research revealed past behaviour to have an independent effect (ie effects that are not mediated) on both intentions and future behaviour (eg. Bentler & Speckart, 1979; Bentler & Speckart, 1981; Bagozzi, 1981; Liska, 1984). According to Ajzen (1991) past behaviour may reflect the influence of another unmeasured variable, the most likely candidate being the PBC construct. Therefore, consistent with Bandura (1986) that past behaviour is a source of information regarding control or mastery, Ajzen (1988) theorised that perceived control should fully mediate the effects of past responses. However, even with the addition of PBC, past behaviour has emerged as an independent predictor of both intentions and behaviour (eg. Valois *et al.*, 1988; Ajzen, 1991; Van der Velde & van der Plight, 1991; Rise, 1992;

Terry, 1993; Bagozzi & Kimmel, 1995; Boldero, 1995; DuCharme & Brawley, 1995; Norman & Smith, 1995; Quine & Rubin, 1997; Verplanken, Aarts, van Knippenberg & Moonen, 1998). In some cases past behaviour has emerged as the best predictor of intentions suppressing the effects of other variables (eg. Norman & Smith, 1998).

5.2.6. Interaction between past behaviour and PBC

However, while the TPB is clearly applicable to a wide variety of behaviours, research suggests that the influence of past behaviour on behavioural decisions may be attenuated by the degree of perceived control. For example, Bunce and Birdi (1998) found past behaviour to only have an independent effect on intentions in situations of high autonomy (high perceived control) when the independent effects of PBC were low. This suggests that the past behaviour-intention relationship will be stronger under conditions of more autonomy (and hence more opportunity) to perform behaviour. Since raising the issue like many work-related behaviours is likely to have become routinised, PBC may moderate the effects of past behaviour on practice nurses' intentions to raise the issue of weight loss.

5.2.7. Self-regulatory theory (SRT)

The most comprehensive model for the representation of illness[24] is self-regulatory theory (Leventhal *et al.*, 1984, see chapter three). The TRA/TPB largely focuses on expectations regarding behavioural performance: the measurement of attitudes, social approval and perceived control are all contingent on the future performance or

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[24]The terms 'illness cognitions' will be used to refer to beliefs about obesity. The terms 'social cognitions' will be reserved for beliefs about behaviour although both sets of beliefs are types of social cognitions.

nonperformance of the behaviour in question. In contrast the SRM focuses on beliefs consequent on morbidity including the identity of illness (ie. symptom perception); attributions of causation for the onset of disease (ie. cause of illness), control over future recovery (ie. responsibility for cure of illness), expectations for time span of illness (ie. chronicity) and the functional consequences of disease (eg. susceptibility to future complications). Research suggests that the various illness dimensions are robust and occur across a variety of illnesses and populations including health professionals (Turk *et al.*, 1986).

Although, illness cognitions derive from the spontaneous descriptions provided by patients asked to talk about their illness, it is possible to operationalise and measure illness representations quantitatively. For example, Turk *et al.* (1986) developed a 45-item Implicit Models of Illness Questionnaire in which they identified a four-factor structure commensurate with Leventhal's categories encompassing disease seriousness, personal responsibility for recovery, controllability over illness onset and changeability of disease over time. Similarly, Schiaffino and Cea (1995) identified a four-factor structure covering 'curability of illness' which reflected the belief that illness is curable, not permanent and not chronic; 'personal responsibility' for the occurrence or cause of the illness; 'symptom variability', reflecting both the controllability and changeability of the illness over time and 'seriousness of consequences' associated with the illness such as pain and disability. Similarly, Bishop (1991) suggests that two core dimensions of disease representation exist in terms of the controllability of disease onset (contagiousness of disease) and the extent to which the disease is life threatening. More recently, Weinman *et al.* (1996) developed the Illness Perception Questionnaire based

explicitly on Leventhal's commonsense model of illness.

However, although useful in understanding patients response to illness, as a theoretical model of the self-regulation of behaviour, illness cognitions have not generally been used to predict health professionals' behaviour. Nevertheless, as discussed in chapter three, parallels exist between the illness dimensions themselves, attributions of causation (Weiner, 1980; 1985) and the constructs contained in the health belief model (Becker *et al.*, 1977; Janz & Becker, 1984). For example, the illness cognitions 'cause' and 'cure/control' are conceptually similar to attributions of causation and expectations for future recovery both of which are related to the self-regulation of a variety of actions such as, screening attendance (King, 1982); smoking cessation (Eiser, van der Plight, Raw & Sutton, 1985) and compliance with medical regimes (Stenström, Wikby, Andersson & Rydén, 1998). The dimension illness 'identity' which is measured with 'symptom perception' is conceptually similar to 'disease severity' as conceptualised in the health belief model. Perceptions of disease severity have been shown to predict a variety of health behaviours (Harrison *et al.*, 1992; Abraham & Sheeran, 1996). Although, the illness dimension 'consequence of disease' considers a broad category of disease consequence, the role of the narrower concept of 'perceived susceptibility' has received intense coverage in decision-making as a more distal predictor of behaviour (Van der Plight, 1998).

5.2.8. The relationship between illness and treatment cognitions

Nevertheless, several authors have theorised about the relationship between beliefs consequent on behaviour and beliefs consequent on disease although no clear agreement

exists. Fishbein and Ajzen assert that variables other than attitudes, subjective norms and PBC influence intentions only via their impact on the TPB constructs. Thus the theory specifies that attitudes, subjective norms and PBC are both the proximal and *sufficient* determinants of intentions and behaviour. In accordance with such a hypothesis, Fishbein and Middlestadt (1989) suggest that specific illness beliefs such as perceived severity and susceptibility influence intentions via their impact the attitudinal components. However, few studies have investigated the temporal relationship between the two sets of predictors (Sheeran & Abraham, 1996). In one of the few empirical comparisons King (1982) examined the predictive ability of aspects of illness cognitions (attributions of disease causation) and health beliefs. The results revealed that attributions of causation added significantly to the prediction of attendance at blood pressure screening: attributions were therefore not entirely mediated by the health belief constructs. However, several studies have suggested that the performance of the HBM is inferior to the TRA/TPB (eg. Brown, DiClemente & Reynolds, 1991; Warwick *et al.*, 1993). The obverse finding has also been reported (eg. Hill *et al.*, 1985; Mullen *et al.*, 1987). Since, the sufficiency hypothesis only holds under the proviso that more proximal predictors of decisions have been adequately measured, it cannot be precluded that the independent effect of attributions on screening uptake reported by King may have arisen because of insufficient measurement of the more proximal behavioural antecedents. However, no studies have empirically compared illness cognitions with the TPB.

5.3. AIMS

In summation, little is known about the relationship between health professionals beliefs

about obesity and their weight management behaviour. Therefore, the present study aimed to examine practice nurses' intentions to raise the issue of weight loss with overweight patients using an integration of the TRA/TPB and the SRM as a theoretical framework. Since raising the issue may present problems with volitional control this study purposed to explore the distinction between self-efficacy and perceived control and to compare the predictive ability of the TRA with the TPB. With the need to clarify the relationship between expectancies consequent on behaviour and those consequent on disease, this study aimed to investigate the role of illness cognitions as determinants of both self-related beliefs and behavioural decisions by comparing the predictive ability of the TPB constructs to those contained in the SRM. Finally, this study aimed to explore the role of past behaviour on practice nurses' intentions to raise the issue of weight loss.

5.4. METHODOLOGY

5.4.1. PARTICIPANTS AND PROCEDURE

Three FHSA's were selected from the South of England using the Directory of Health Services Authorities (1992) as a sampling frame. Participating FHSA's were: Hertfordshire; Bedfordshire; and Redbridge & Waltham Forest. Using FHSA records, 175 practices were randomly selected and one practice nurse was contacted from each practice. A structured questionnaire was mailed to the 170 practice nurses. Reminders were sent 4 and 8 weeks after the first mailing. The response rate was 58% (*N*=102/175).

5.4.2. DESIGN

A cross-sectional design was used. The questionnaire comprised the following measures to assess the central components of the theoretical models. In accordance with the TPB item wording was compatible in terms of the action (ie. raising the issue of weight loss); the context (ie. with all overweight patients) and the time frame (ie. during the next month). All dimensions of the TPB were measured on 7 point Likert scales and operationalised following Ajzen's (1990) recommendations.[25] All dimensions of the SRM were measured on 7 point Likert scales and operationalised in accordance with Weinman *et al.*'s (1996) recommendations.

5.4.3. MEASURES

5.4.3.1. Theory of planned behaviour items

i) Behavioural intentions: Six items were used to assess behavioural intentions. The items covered intentions (ie. *I intend to raise the issue of weight loss, I plan to raise the issue of weight loss*) anchored from 'definitely do not' to 'definitely do'; desires (ie. *I want to raise the issue of weight loss, I am committed to raising the issue of weight loss*) anchored from 'strongly disagree' to 'strongly agree'; and self-predictions (ie. *how likely is it that you will raise the issue of weight loss, I will raise the issue of weight*

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[25]Underpinning the TRA/TPB are three principles for it's application: specificity, comparability and aggregation. Specificity principle asserts that specific attitudes predict specific behaviours and general attitudes predict general behaviours. Compatibility principle asserts that measurement of attitudes and behaviour must be compatible in the sense that their target, action, context and time elements are assessed at identical levels of generality or specificity. Aggregation principle general attitudes do not predict specific instances of behaviour but do predict aggregation of specific instances.

loss) anchored from 'extremely unlikely' to 'extremely likely'. Responses were made on 7 point scales scored from -3 to +3, so that the higher the score the more positive the intention to raise the issue of weight loss.

ii) Perceived behavioural control: Perceived behavioural control comprised of seven items covering both the degree of control practice nurses believed they had over raising the issue (ie. *whether I do or do not raise the issue is entirely up to me; I have complete control over whether or not I raise the issue; it is entirely my decision whether or not I raise the issue*) and the degree to which practice nurses believed they could raise the issue of weight loss (ie. *I am confident that I can raise the issue of weight loss; raising the issue will be easy; I am certain if I wanted to I could easily raise the issue; I am confident in my ability to raise the issue*). Responses were made on 7 point scales anchored from 'strongly disagree' to 'strongly agree' and scored from -3 to +3 so that the higher the score the greater the degree of perceived control.

iii) Attitudes: Attitude was obtained by asking practice nurses to indicate their attitude towards raising the issue of weight loss on six 7 point semantic differential scales (unimportant-important; unpleasant-pleasant; dissatisfying-satisfying; worthless-valuable; undesirable -desirable; rewarding-unrewarding). Responses were scored from -3 to +3 so that the higher the score the more positive the attitude.

iv) Subjective norms: Two items were used to assess subjective norms (ie. *most people who are important to me would approve of me raising the issue of weight loss, most people who are important to me think I should raise the issue of weight loss*). Anchored

from 'disapprove' to 'approve' and 'extremely unlikely' to 'extremely likely' respectively. Responses were made on 7 point scales scored from -3 to +3 so that the higher the score the greater the degree of perceived normative pressure.

5.4.3.2. Self-regulatory items

i) Cure/control over solutions to obesity: The causes of failed weight loss attempts were measured by asking practice nurses '*to what extent do you feel failure to lose weight is due to...*', a list of eight possible reasons for why people may not lose weight was provided. The list included items covering internal causes (lack of motivation, noncompliance with weight loss advice, failure to try, despondency) and external causes (lack of knowledge, lack of advice, lack of information, lack of help and support). Responses were made on 7 point scales anchored from 'not at all' to 'completely' and scored 1 to 7 so that the higher the score the lower the perceived control over obesity.

ii) Causes of obesity onset: Causes of obesity were measured by asking practice nurses: '*to what extent do you agree that the following factors play a significant role in the development of obesity...*', a list of 15 different possible causes of obesity derived from study one were provided. The list covered uncontrollable biological causes; controllable eating behaviour and controllable lifestyle factors (ie. genetic make-up, low metabolic rate, increased fat cell number, hormonal problems, natural body type; excessive calorie intake, eating the wrong foods, eating too much, eating for comfort; sedentary lifestyle, eating habits, eating fatty foods, availability of high fat foods, lack of exercise, low energy output). Responses were made on 7 point scales anchored from 'disagree' to

'agree' and scored 1 to 7 so that the higher the score the more likely the cause.

iii) Medical consequences of obesity: The consequences of obesity were assessed by asking practice nurses: '*in comparison to patients of average weight, what is the likelihood that overweight patients will suffer from the following health problems in the future...*'. A list of ten common weight related health problems were provided, covering cardiovascular consequences (ie. coronary heart disease, stroke, hypertension, cholesterol, diabetes) and non cardiovascular consequences (ie. joint trauma, osteoarthritis, gall stones, certain cancers; psychological problems). Responses were made on 7 point scales anchored from 'much below average' to 'much above average' and scored 1 to 7 so that the higher the score the more likely the consequence.

iv) Time line: Time line was measured with three items to reflect the extent to which obesity is potentially a static or variable condition (ie. *weight gain is permanent, weight loss cannot be sustained, weight cannot be controlled over time*). Responses were made on 7 point scales anchored from 'disagree' to 'agree' and scored 1 to 7 so the higher the number the less alterable weight gain is perceived to be.

v) Illness identity/symptom perception: Illness identity was assessed by asking participants to rate the extent to which they thought a number of symptoms were associated with being overweight. The list of symptoms derived from the medical literature included breathlessness, fatigue, stiff joints, sleep difficulties and loss of strength. Responses were made on 7 point scales anchored from 'disagree' to 'agree' and scored 1 to 7 so that the higher the score the greater the severity of symptoms.

5.4.3.3. Past behaviour

Past behaviour was measured with one item (*during the last month I have raised the issue of weight loss with all overweight patients*). Responses were made on 7 point scales anchored from 'very infrequently' to 'very frequently' and scored -3 to +3 so the higher the rating the more frequent the behavioural performance.[26]

5.4.3.4. Profile characteristics

Occupational profile characteristics included: nursing qualifications, year of qualification, number of years in general practice, number of hours worked per week, and whether or not their practice is within a deprived area. Personal profile characteristics included the following: age, dieting status, height and weight (from which body mass index (BMI) was then calculated using the formula weight kg/height m^2).

5.5. RESULTS

Data analysis

All analyses were performed using SPSS. Following data screening, data reduction using principal components analysis where appropriate[27] and reliability analysis

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[26] Although it has been suggested that both frequency and recency of past behaviour may be important in predicting future behaviour (Bagozzi & Warshaw, 1990), since weight management is performed routinely (most practice nurses give weight loss advice at least once a week) only frequency of past behaviour was measured. Frequency is traditionally used to measure habit (Ouellette & Wood, 1997).

[27] Kaiser-Meyer-Olkin measure of sampling adequacy revealed that the distribution of values were good for conducting factor analysis (KMOs> .80) and Barlett test of sphericity was significant ($p<.05$) revealing multivariate normality of the set of distributions. Data reduction for illness cognition constructs are reported separately. However, identical results were obtained when the data were subjected to one large factor analysis.

employing Cronbach's alphas were performed (Cronbach, 1951). Factor loadings of >.45 were considered adequate (Tabachnick & Fidell, 1989) and a Cronbach's alpha of >.65 was considered reliable (George & Mallery, 1995). Sample characteristics are then presented and preliminary analysis using descriptive statistics are shown. For the main analysis a series of hierarchical multiple and simultaneous regressions were conducted. Following the hypothesised theoretical structure of antecedents of intentions and previous analysis (King, 1982; Warwick, *et al.*, 1993; Abraham, *et al.*, 1996, Orbell, *et al.*, 1996), independent variables were entered in theoretically specified stages. Although adding variables in stages is a conservative analytic procedure, it is the preferred method for testing whether variables add uniquely to the prediction of intentions above the established theory (Terry, 1993). A combination of multivariate and univarate analysis was used to examine the relationships between the social and illness cognitions and behavioural decisions. The first set of analysis for intentions compared the predictive[28] ability of TRA to TPB, examining whether control expectancies (self-efficacy and perceived control) significantly improved the prediction of intentions after controlling for the relevant components of the TRA. A test of the hypothesis in which PBC moderates the effects of the other components of TPB as Ajzen (1991) suggests was made. The second set of analysis examined the predictive ability of illness cognitions and considered the sufficiency of the TPB to mediate the effects of illness cognitions and past behaviour. The final set of analysis investigated the hypothesis that PBC moderates the effects of past behaviour on intentions (Bunce & Birdi, 1998) and compared the predictive power of an additive, a multiplicative and

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[28] The terms 'predictive' and 'prediction' are used throughout this report in an analytic senses and are not meant to imply causality.

a threshold computational formula for perceived threat (Stretcher & Rosenstock, 1997).

5.5.1. Preliminary data analysis

5.5.1.1. Data screening prior to the main analysis

No item had more than 7% of data missing. All missing items were recoded using item means (Tabachnick & Fidell, 1989). Normality was assessed using a combination of probability plots and descriptive statistics. A cutoff point of $<\pm 2$ for both skewness and kurtosis was used (George & Mallery, 1995). Results of evaluation of assumptions of normality revealed that normality was satisfactory for all variables. Univariate outliers were searched for using a dummy dependent variable and a *z*-score of $>\pm 3$. No item had more than 1.5% identified as outliers. Since the number of outliers were small, loss of variance was not anticipated and outliers were therefore recoded using the group mean (Tabachnick & Fidell, 1989). No multivariate outliers were found using a dummy independent variable in a multiple regression and a Malahabas distance of (χ^2=27.69 [1:13], p<.01). Inter-item correlations among all variables revealed that multicollinearity was not a problem since all correlations were less than .80 (Bryman & Cramer, 1994). The minimum case-to-independent-variable ratio was 8.5:1, which fell within the 5:1 ratio considered adequate for conducting multiple regression (Tabachnick & Fidell, 1989). Multivariate statistical analysis was therefore undertaken.

5.5.1.2. *Profile characteristics and sample*

All practice nurses were female. The mean age for practice nurses was 44.39 $\pm$ 8.35 with an age range of 27-64. In total 98% of the practice nurses were more than 30 years

old. The mean body mass index for the practice nurses was 24.46 (±3.34) with 31.4% of the practice nurses being overweight (BMI > 24.9) and a further 6.9% were obese (BMI>29.9) which is slightly lower than the national average for females. In total 91.2% of the respondents were registered general nurses/state registered nurses and 8.8% state enrolled nurses. The range of post-registration qualifications included midwifery (15.6%) and district nursing (12.7%). The most frequently reported working week was 10-20 hours (50%) with 11.8% working more than 30 hours and only 7.8% working less than 10 hours. Only 21.5% of practice nurses had worked in general practice for more than 10 years, a third reported working in general practice for less than 5 years (30.4%). The sample are slightly older and consequently a slightly higher percentage have worked in general practice for more than 10 years in comparison to samples reported elsewhere (eg. Ross *et al.*, 1994). Using t-tests and χ^2 no significant differences were found between intenders and non-intenders (on the basis of a median split on the intention item) on any of the profile characteristics measured.

5.5.2. Data reduction and reliability

Theory of planned behaviour constructs

i) Behavioural intentions: It has been suggested that intentions, self-predictions and desires may be considered separate dimensions where intentions are conscious plans, expectations are estimations of the likelihood of behaviour (Warshaw & Davis, 1985) and desires are a motivational commitment to act (Bagozzi, 1992). However, others have found such items either to load onto one factor (Conner & Sparks, 1996) or to be

distinct only under certain circumstances (ie. in relation to goal pursuit, Fishbein & Stasson, 1990). Since in the present study the items formed a reliable scale and formed one factor the decision was made to combine them to form a single measure of intentions. Reliability analysis yielded a Cronbach's alpha of 0.94, suggesting that they formed a reliable scale.

ii) Perceived behavioural control: Following suggestions (Triandis, 1977) and recent empirical support (eg. White *et al.*, 1994) that perceptions of control (perceived control) and perceptions of ease (self-efficacy) are conceptually distinct dimensions, principal component analysis with varimax rotation was conducted on the seven perceived behavioural control beliefs. Table 5.1. contains factor loadings for perceived behavioural control.

Table 5.1: Factor loadings for perceived behavioural control

Variables	Factors	
	Self-efficacy	**Perceived control**
I am confident	.87	
For me it will be easy	.87	
I am certain I could	.87	
I am confident in my ability	.86	
I have complete control		.70
It is entirely up to me		.92
It is entirely my decision		.91
Cronbach's alpha coefficients	.92	.84

Only factor loadings >.45 are shown

As expected analysis of the perceived behavioural control items led to two factors being generated with factor loadings ranging from 0.70 to 0.92 accounting for 79.4% of the total variance. The two factors were labelled self-efficacy and perceived control and yielded Cronbach's alphas of 0.84 and 0.92 respectively, suggesting that they formed two reliable measures.

iii) Attitudes: The five measures of attitude were summed. Reliability analysis yielded a Cronbach's alpha of 0.80 suggesting that they formed a reliable measure.

iv) Subjective norms: The two items used to assess subjective norms were summed. Reliability analysis yielded a Cronbach's alpha of 0.83 suggesting that they formed a reliable measure.

Self-regulatory constructs

i) Cure/control over solutions to obesity: Principal component analysis with varimax rotation was conducted on beliefs about solutions to obesity. In total two factors were generated with factor loadings ranging from 0.49 to 0.90 accounting for 60.0% of the total variance (see table 5.2) for factor loadings). The two factors were labelled 'external cure' and 'internal cure' and yielded Cronbach's alphas of 0.80, and 0.49 respectively, suggesting only one reliable measure. Since, reliability could not be improved by deleting any one of the 'internal cure' items (Cronbach, 1951) they were subsequently dropped from further analysis.

Table 5.2: Factor loadings for cure/control over solutions to obesity

Variables	Factors	
	External cure	**Internal cure**
Lack of advice	.90	
Lack of information	.87	
Lack of help	.70	
Lack of knowledge	.66	
Following advice		.87
Motivation		.70
Trying		.49
Despondent		
Cronbach's alphas	.80	.49

Only factor loadings >.45 are shown

ii) Causes of obesity onset: Principal component analysis with varimax rotation was conducted on beliefs about causes of obesity. In total 3 factors were generated with factor loadings ranging from 0.58 to 0.85 accounting for 66.1% of the total variance (see table 5.3 for factor loadings). The three factors were labelled 'lifestyle causes of obesity', 'biological causes of obesity' and 'eating behaviour causes of obesity'. The three factors yielded Cronbach's alphas of 0.82, 0.83 and 0.84 respectively, suggesting that they formed three reliable measures.

Table 5.3: Factor loadings for causes of obesity

Variables	Factors		
	Lifestyle causes of obesity	**Biological causes of obesity**	**Eating causes of obesity**
Sedentary lifestyle	.78		
Lack of exercise	.76		
Eating fatty foods	.71		
Availability of fatty food	.65		
Low energy output	.64		
Eating habits	.58		
Natural body type		.85	
Genetic makeup		.82	
Hormones		.80	
Fat cells		.76	
Metabolism		.73	
Eating the wrong food			.84
Eating too much			.71
Eating too many calories			.65
Eating for comfort			.64
Cronbach's alphas	**.82**	**.83**	**.84**

Only factor loadings >.45 are shown

iii) Medical consequences of obesity: Principal component analysis with varimax rotation was conducted on beliefs about consequences of obesity. In total two factors were generated with factor loadings ranging from 0.54 to 0.86 accounting for 62.3% of the total variance (see table 5.4 for factor loadings). The two factors were labelled 'cardiovascular health risks' and 'non cardiovascular health risks' and yielded Cronbach's alphas of 0.85 and 0.83 respectively, suggesting that they formed two reliable measures.

Table 5.4: Factor loadings for consequences of obesity

Variables	Factors	
	Risks to Cardiovascular health	**Risks to non-cardiovascular health**
Heart attack	.86	
Hypertension	.83	
Stroke	.77	
Diabetes	.67	
Cholesterol	.63	
Osteoarthritis		.83
Gall stones		.83
Joint trauma		.82
Certain cancers		.69
Psychological problems		.54
Cronbach's alphas	.85	.83

Only factor loadings >.45 are shown

iv) Time line: The three items used to measure time line were summed. Reliability analysis yielded a Cronbach's alpha of 0.68. Although reliability was moderate, it could not be improved by deleting any one of the items (Cronbach, 1951).

v) Illness identity/symptom perception: The five items used to measure illness identity were summed. Reliability analysis yielded a Cronbach's alpha of 0.83 suggesting they formed a reliable scale.

5.5.3. Descriptive data and preliminary univariate analysis

Prior to performing the regression analysis, preliminary analysis comprising of means and zero order correlations between the different constructs were conducted. Means for the main study variables are given in table 5.5.

Table 5.5: Means and standard deviations for main study variables

	Theoretical range	Overall means [s.d] $N = 102$
Past behaviour	-3 to +3	1.04 [1.62]
Intentions	-3 to +3	0.69 [1.73]
Attitudes	-3 to +3	0.75 [1.15]
Subjective norms	-3 to +3	0.80 [1.62]
Self-efficacy	-3 to +3	1.04 [1.45]
Perceived control	-3 to +3	1.57 [1.45]
Symptoms	1 to 7	5.19 [0.88]
Cardiovascular risk	1 to 7	5.95 [0.73]
Non-cardiovascular risk	1 to 7	5.22 [0.88]
Biological causes of obesity	1 to 7	4.49 [1.12]
Eating causes of obesity	1 to 7	6.40 [0.64]
Lifestyle causes of obesity	1 to 7	6.07 [0.70]
Time-line	1 to 7	2.80 [1.33]
External responsibility for cure/control	1 to 7	4.62 [1.24]

Note: To facilitate comparisons average sums were used for all items.

As can be seen from table 5.5, intentions to raise the issue of weight loss were moderate ($\bar{x}$ =0.69, sd. 1.73) suggesting that as a group practice nurses were reasonably motivated to raise the issue of weight loss. Reported frequency of past behaviour was similarly moderately positive ($\bar{x}$ =1.04; s.d. 1.62) although slightly higher than future intentions.

Attitudes towards raising the issue of weight loss were positive ($\bar{x}$ =0.75; s.d. 1.15) and perceptions of social pressure reasonably strong ($\bar{x}$ =0.80; s.d. 1.62). Perceptions of control were high ($\bar{x}$=1.57; s.d. 1.45) suggesting that practice nurses did not perceive raising the issue to be beyond their personal control. Although, significantly lower than perceptions of control (t=3.71, p<.001), ratings of self-efficacy were still positive ($\bar{x}$=1.04, s.d. 1.45) suggesting that practice nurses did not perceive any major barriers to performing the behaviour.

Health risks of obesity were rated high: symptom severity ($\bar{x}$ =5.19; s.d. 0.88), cardiovascular ($\bar{x}$ =5.95; s.d. 0.73) and non-cardiovascular risks ($\bar{x}$ =5.22; s.d. 0.88) were all rated above the midpoint of the scales. The majority of practice nurses considered obesity to be caused by eating behaviour ($\bar{x}$ =6.40; s.d. 0.64) and lifestyle ($\bar{x}$ =6.07; s.d. 0.70). In contrast biology was rated as neutral by the majority of practice nurses ($\bar{x}$ =4.49; s.d. 1.12). Ratings of eating causes were significantly higher than ratings of lifestyle causes (t= -6.03, p<.001) and biological causes (t= -16.96, p<.001); ratings of lifestyle causes were significantly higher than ratings of biological causes (t= 14.23, p<.001). Obesity was not considered a chronic disorder with ratings of time-line well below the midpoint ($\bar{x}$ =2.80; s.d. 1.33). External control over recovery were rated just above the midpoint suggesting that practice nurses were moderate in their belief that failed weight loss resulted from lack of help ($\bar{x}$ =4.62; s.d. 1.24).

Zero order correlations for the main variables are given in table 5.6.

Table 5.6: Zero-order correlations between the main study variables

	I	Att	SN	SE	PC	S	RC	RN	L	E	B	C	TL
Past behaviour	.62 ***	.38 ***	.50 ***	.56 ***	.19	.19	.19	.02	.12	.11	.12	-.04	-.07
Intentions (I)		.55 ***	.76 ***	.72 ***	.34 ***	.27 **	.23 *	.03	.12	.14	.20 *	-.03	-.10
Attitudes (Att)			.43 ***	.51 ***	.30 **	.19	.16	.01	.06	.10	.18	-.01	-.06
Norms (SN)				.54 ***	.36 ***	.22 *	.24 *	.21 *	.12	.19	.18	-.07	-.15
Self-efficacy (SE)					.51 ***	.24 *	.22 *	.06	.23 *	.20 *	.17	-.05	-.07
Perceived control (PC)						.07	.15	.10	.17	.10	.21 *	-.08	-.04
Symptoms (S)							.46 ***	.41 ***	.45 ***	.37 ***	.24 *	.17	.08
Risk cardio (RC)								.48 ***	.44 ***	.50 ***	.10	.15	-.10
Risk non-cardio (RN)									.41 ***	.33 **	.11	.12	.04
Lifestyle causes (L)										.68 ***	.30 **	.20 *	-.15
Eating causes (E)											.25 *	.23 *	-.14
Biological causes (B)												.20 *	12
Cure (C)													-.04
Time line (TL)													

Correlations significantly different from zero (two tailed test), **p=<.01, ***p=<.001,*p=<.05.

Correlates of intentions and social cognitions

As shown in table 5.6 univariate analysis between cognitions and intentions revealed that intentions to raise the issue were significantly associated with self-efficacy (r =.72, p<.001), subjective norms (r =.76, p<.001), attitudes (r =.55, p<.001), perceived control (r = .34, p<.001), symptoms (r =.27 p<.01), cardiovascular health risks (r =.23 p<.05)

and biological causes of obesity (r =.20, p<.05). As expected among the social cognition variables, the highest correlates of intentions were the hypothesised antecedents: beliefs towards the behaviour in terms of attitudes, subjective norms and perceived behaviourial control. Correlations between intentions were lower for the beliefs about obesity. Among the illness cognitions, symptoms significantly positively correlated with consequences (cardiovascular r =.48, p<.001; non-cardiovascular r = .44, p<.001) and causes of obesity (lifestyle r =.45, p<.001; eating r =.37, p<.001; biology r =.24, p<.05). The only cognitions to correlate with cure/control were causes of obesity (lifestyle r =.20, p<.05; eating r =.23, p<.05; biology r =.20, p<.05). However, time-line was uncorrelated with any of the other beliefs. Nevertheless, the majority of the illness cognitions were significantly intercorrelated. Correlations in the enclosed box, revealed few interrelationships between illness cognitions and the theory of planned behaviour variables: 11/40 correlations were significant.

Correlates of past behaviour

Univariate analysis between the social cognition variables and past behaviour showed that raising the issue of weight loss was significantly associated with intentions to raise the issue (r =.62, p<.001), self-efficacy (r =.56, p<.001), subjective norms (r =.50, p<.001) and attitudes (r =.38, p<.001). As expected, among the social cognition variables the highest correlates of behaviour were obtained for the hypothesised antecedents of behaviour: self-efficacy and behavioural intentions. None of the illness cognitions significantly correlated with reported behaviour.

5.5.4. MAIN MULTIVARIATE ANALYSIS

5.5.4.1. HYPOTHESES

- If practice nurses' intentions to raise the issue of weight loss are influenced by attitudes and subjective norms then the TRA constructs will predict intentions.
- If practice nurses doubt the extent to which raising the issue is under their volitional control then after controlling for TRA constructs, adding PBC (self-efficacy and perceived control) will significantly increase the prediction of intentions.
- If PBC (self-efficacy and perceived control) differentially influences the effects of the TPB constructs on intentions, the addition of interaction terms will add significantly to the prediction of intentions.
- If practice nurses' intentions to raise the issue of weight loss are influenced by their representation of obesity then illness cognitions will predict behavioural intentions.
- If the TPB is sufficient the effects of illness cognitions and past behaviour will be fully mediated by the TPB constructs (attitudes, subjective norms, PBC).
- If PBC differentially influences the effects of past behaviour on intentions, the addition of interaction terms will add significantly to the prediction of intentions.
- If an interaction or threshold model of threat expectancy is superior to an additive model, then the addition of multiplicative formulas for the calculation of threat will add significantly to the prediction of intentions (Ronis, 1992; Stretcher & Rosenstock, 1997).

Comparing the theory of reasoned action to the theory of planned behaviour

For the analysis comparing TRA to TPB in the prediction of intentions, attitude and subjective norm were entered into the first step of a hierarchical regression analysis. Self-efficacy and perceived control were then entered on the second step. This procedure allowed for an examination of whether self-efficacy and perceived control influenced behavioural intentions, after controlling for the effects of attitude and subjective norm constituting a test of the predictive ability of the TPB in comparison to the TRA. The results of the analysis are presented in table 5.7.

Table 5.7: Hierarchical regression analysis of the TRA and TPB onto intentions

Step	Variable	*r*	Sr^2	Beta	R^2ch.	R	R^2	Δ R^2
Step 1 : Theory of reasoned action								
[1]	Attitudes	.55***	.06	.28***				
	Subjective norms	.76***	.33	.64***	.64***	.80	.64	.63
Step 2: Theory of planned behaviour								
[1]	Attitudes	.55***	.02	.15*				
	Subjective norms	.76***	.17	.50***	.64***	.80	.64	.63
[2]	Self-efficacy	.72***	.09	.42***				
	Perceived control	.34***	<.01	-.10	.10***	.85	.73	.72

Beta coefficients computed after all variables entered into equation, p<.001*** p<.01** p<.05* Δ=Adj.

As shown in table 5.7, the first step of the hierarchical regression representing the TRA accounted for 63% of the variance in intentions with significant beta weights for both attitudes and subjective norms (F [2:99]=86.09, p<.0001). However, the addition of PBC (self-efficacy and perceived behavioural control) led to a significant increment in explained variance (R^2 *ch.* = 10%, F*ch.* [4:97]=17.15, p<.0001) and together the TPB

constructs accounted for 72% of the variance in intentions. With the addition of self-efficacy and perceived control, the beta weights for both attitudes and subjective norms were slightly attenuated (particularly for attitudes) although they remained significant. An examination of perceptions of control revealed that only self-efficacy was uniquely contributing to the prediction of intentions: the beta weight for perceived control was not significant. Comparisons of the standardised regression coefficients indicate that subjective norms were the most significant contributor to intentions (β=.50) followed by self-efficacy (β=.42) and attitudes (β=.15). Examination of the sum of squared semi-partial correlations (Sr^2) indicates that the three significant variables in combination contribute 45% in shared variability.[29] Overall, the results show that practice nurses were more likely to intend to raise the issue not only if they had positive attitudes and perceived normative pressure to do so but if they had high confidence in their ability to raise the issue regardless of levels of perceived control. Therefore, providing support for the TPB, to the extent that adding a dimension of control improves the predictive ability of the TRA.

Testing for interactions

Since, Ajzen (1991) suggests that the effects of PBC on intentions may be interactive (ie. measures of behavioural control may moderate the effects of the other components), the interactive effects of self-efficacy and PBC were tested. After controlling for attitudes, subjective norms and perceived behavioural control, the addition of interaction terms for self-efficacy (products of self-efficacy, attitudes and subjective

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[29]Squared semi-partial correlations (Sr^2) indicate the amount of R^2 attributable to unique sources. Shared variance is derived from the difference between R^2 and the sum of Sr^2 (Tabachnick & Fidell, 1989).

norms) and perceived control (products of perceived control, attitudes and subjective norms) did not result in a significant increase in explained variance ($R^2ch.$=.01; F*ch.*[8:93]=.64; p>.05). Therefore no support was found for the assertion that perceived behavioural control moderates the relationship between attitudes/subjective norms and intentions. Perceived behavioural control would therefore appear to combine additively with the other two constructs to predict intentions.

Regression of intentions onto illness cognitions

Since regressing illness cognitions onto intentions after the TPB is a conservative test of illness cognitions testing only for the addition of unique variance, to test the predictive ability of the SRM, illness cognitions were simultaneously regressed onto intentions. The results are shown in table 5.8.

Table 5.8: Simultaneous regression analysis of SRM onto intentions

Variable	*r*	Sr^2	Beta	R	R^2	ΔR^2
Illness cognitions						
Symptoms	.27**	.04	.25*			
Cardiovascular risk	.23*	.02	.20			
Non-cardiovascular risk	.03	.01	-.14			
Time line	-.10	.02	-.13			
Cure/control	-.03	.01	-.11			
Biological causes of obesity	.20*	.03	.19			
Lifestyle causes of obesity	.12	>.01	-.10			
Eating causes of obesity	.14	>.01	.02	.39*	.15	.08

Beta coefficients computed after all variables entered into equation, p<.01** p<.05*

As shown in table 5.8, the results of the simultaneous regression of intentions onto

illness cognitions accounted for 8% of the variance in intentions (R=.39; F [8:93]=2.09; $p<.05$). Perceptions of symptoms were the only illness cognition with a significant beta weight uniquely contributing 4% of the variance (Sr^2). Therefore, the more likely practice nurses were to believe that obesity was associated directly with negative health consequences (ie. seriousness of obesity) the more likely they were to intend to raise the issue of weight loss in the future.

Comparing and combing illness cognitions with the theory of planned behaviour

As can be seen by comparing tables 5.7 and 5.8, both the TRA and TPB explained considerably more variance in intentions than illness cognitions (ΔR^2 =.63 and .72 respectively). However, it could be argued that illness cognitions if containing a subjective norm element and a perceived control element would perform at a level comparable to the TPB. A similar argument has been put forward with regard to comparing the health belief model with the TRA (Morin, 1988; Warwick *et al.*, 1993). The adoption of such a strategy constitutes a comparison of attitudes towards behaviour as conceptualised by TRA/TPB versus attitudes towards obesity as conceptualised by illness cognitions. In a direct test of the attitudinal components of TPB versus illness cognitions, adding the single attitude item to all eight illness cognitions led to a significant increase in explained variance (R^2 *Ch.*=.21; F[9:92]=29.45; $p<.0001$).[30] Since a direct comparison of attitudes does not take account of multivariate shared variance between the constructs, comparisons between the two conceptualisations of attitudes were also made in the context of using two separate hierarchical regression

[30]Adding illness representations to attitudes resulted in a non-significant change in R^2 (p>,05).

analysis in which subjective norms and perceived behavioural control were entered in the first step. With the addition of attitudes towards behaviour the degree of explained variance increased significantly (R^2 *Ch.*=.02; F[4:97]=6.00; $p<.05$). In contrast the addition of illness cognitions resulted in a non-significant change in R^2(R^2 *Ch.*=.03; F [11:90]=1.49; $p>.05$). This suggests that the attitudinal component of the theory of planned behaviour adequately captured the illness cognitions measured in the present study.

Adding illness cognitions and past behaviour

The components of TPB (attitude, subjective norm, self-efficacy and perceived control) were entered into the first step of a hierarchical regression analysis. Illness cognitions were then entered on the second step. This procedure allowed for an examination of whether illness cognitions influenced behavioural intentions, after controlling for the effects of the theory of planned behaviour. The results of the analysis are presented in table 5.9.

As shown in table 5.9 after controlling for the effects of the TPB variables (attitude, subjective norms, self-efficacy and perceived control) illness cognitions did not explain a significant increment of variance in behavioural intentions (R^2*ch.*= 3%; F*ch.* [12:89]= 1.18, $p>.05$). However, the addition of past behaviour resulted in a significant increment in explained variance (R^2*ch.*= 2%, F*ch.* [13:88]= 4.12, $p<.05$). The addition of illness cognitions and past behaviour changed the pattern of results so that the beta weight for attitudes was no longer significant although a trend remained ($p<.01$). Examination of the sum of squared semipartial correlations (Sr^2) indicates that the three

significant variables in combination contribute 52% in shared variability. Overall, the results show that the TPB constructs fully mediate the effects of illness cognitions on intentions to raise the issue of weight loss. However, past behaviour independently predicted behavioural intentions after controlling for both the TPB constructs and illness cognitions.

Table 5.9: Hierarchical regression analysis of TPB and SRM onto intentions

Step	Variable	*r*	Sr^2	Beta	$R^2ch.$	R	R^2	ΔR^2
Step 3 and 4: Adding illness cognitions and past behaviour								
[1]	Attitudes	.55***	<.01	.11^T				
	Subjective norms	.76***	.17	.48***				
[2]	Self-efficacy	.72***	.07	.35***				
	Perceived control	.34***	<.01	-.06	.73***	.85	.73	.72
[3]	Symptoms	.27**	<.01	.09				
	Cardio risk	.23*	<.01	.05				
	Non-cardio risk	.03	<.01	-.12				
	Time line	-.10	<.01	-.01				
	Cure/control	-.03	<.01	-.08				
	Biological causes	.20*	<.01	.03				
	Lifestyle causes	.12	<.01	-.04				
	Eating causes	.14	>.01	>-.01	.03	.87	.75	.72
[4]	Past behaviour	.62***	.01	.13*	.02*	.89	.77	.73

Beta coefficients computed after all variables entered into equation, $p<.001$*** $p<.01$** $p<.05$* $p<.10$.^{T}

Testing for interactions with perceived control and past behaviour

Since, Bunce and Birdi (1998) hypothesise that the effects of past behaviour on intentions may be mediated by perceived behavioural control (ie. measures of behavioural control may moderate the effects of past behaviour), the interactive effects

of self-efficacy and perceived control were tested. Hierarchical multiple regression using the interaction terms for past behaviour and perceived behavioural control (products of self-efficacy and perceived control). Intention was regressed on past behaviour and perceived behavioural control at step 1, and at step 2 on the multiplicative interaction term. Step 2 added 4 percent to the variance explained in intention (R^2 *Ch.* =.04; F[5:96]=4.86, $p<.01$). However, in examining the beta weights, only the interaction term for perceived control was significantly related to intentions (β =.31, $p<.05$). The results suggest that perceived control (as distinct from self-efficacy) moderates the relationship between past behaviour and intentions. Using a median split on perceived control consideration of the regression lines for high and low control groups showed past behaviour only to be significantly associated with intentions under conditions of high control.

Testing the computational formula for threat expectancies

Ronis, (1992) suggests that a multiplicative formula for threat expectancies (the product of susceptibility and severity). Stretcher and Rosenstock (1997) suggest a threshold hypothesis (susceptibility + the product of susceptibility and severity). Two hierarchical multiple regression analysis were conducted. After controlling for susceptibility and severity, the two computational formulas were entered on step 2 of separate regressions. However, neither formula added significantly to the prediction of intentions above and beyond that of an additive model. Thus, no support was found for an interaction between severity and perceived risk.

Investigating the relationship between illness and social cognitions

Finally, to investigate the multivariate relationship between illness and social cognitions a final set of regression analysis were conducted. Illness cognitions that were significantly related to self-related beliefs in univariate analysis were regressed onto the TPB constructs (subjective norms and self-efficacy) in a series of separate multiple regression analysis. The results revealed that the multiple correlation between illness cognitions (symptoms, perceived risk, lifestyle and eating attributions) and self-efficacy were not significant ($p>.05$). The multiple correlation ($r = .28$) between subjective norms and the threat related illness cognitions (symptoms and perceived risk) were significant explaining 5% of the variance ($F[3:98]= 2.75$; $p<.05$). However, examination of the regression coefficients revealed that none of the beta weights were significant. Therefore, possibly as a consequence of the high intercorrelations, symptoms and perceived risk were not contributing any unique variance to the prediction of intentions.

5.6. DISCUSSION

The present study examined practice nurses' decisions to raise the issue of weight loss with overweight patients using the TRA/TPB and SRT as theoretical frameworks. In addition, this study investigated the role of illness cognitions both as determinants of social cognitions and of behavioural decisions. The results revealed that motivation to raise the issue was moderate. Attitudes towards raising the issue were positive and perceptions of social support were strong. However, although practice nurses considered raising the issue to be entirely their decision, expectancies regarding

confidence in doing so were lower. This suggests that for these practice nurses behaviour may be controllable in the sense that performance is independent of external constraints but this does not necessarily mean that enacting it is easy. In addition, practice nurses rated obesity as a serious but treatable disorder largely caused by poor eating behaviour. External factors (eg. lack of knowledge) were considered only moderate reasons for failed weight loss attempts. Therefore, the results suggest that practice nurses are reasonably positive both about obesity and the potential role of raising the issue in obesity prevention. Nevertheless, given the increasing need to prevent obesity and weight gain (Department of Health, 1995) the potential exists for the promotion of practice nurses intentions to raise the issue.

5.6.1. Theory of reasoned action vs theory of planned behaviour

The present study compared the predictive ability of the TRA and TPB for explaining the variance in practice nurses' intentions to raise the issue of weight loss. The results revealed that attitudes and subjective norms predicted intentions as suggested by the theory of reasoned action. However, the addition of perceived behavioural control in the form of self-efficacy (as distinct from perceived control) significantly increased the degree of explained variance, providing further support for the TPB in terms of the necessity to include a control related dimension (Ajzen, 1987;1991). The predictive superiority of the TPB above the TRA is consistent with research using both health professional (Millstein, 1996; Bunce & Birdi, 1998) and non-health professional samples (eg. Godin, Velois, Lepage & Desharnais, 1992; Terry, Galligan & Conway, 1993; van der Plight & De Vries, 1995). In combination self-efficacy, attitudes and subjective norms explained 72% of the variance in intentions to raise the issue. Self-

efficacy and subjective norms emerged as the best predictors of intentions.

5.6.2. Subjective norms

The relative importance of subjective norms in the present study can be contrasted with the relatively weak predictive role subjective norms have generally played in patients' health behaviour (Godin & Kok, 1996) but concurs with other applications to the work-related arena (eg. Renfroe, O'Sullivan, & McGee, 1990; Bunce & Birdi, 1998; Millstein, 1996). Since, helping behaviour by definition is other-orientated, health professionals' work behaviour may be governed more by social than interpersonal factors. It is therefore possible that the relative importance of subjective norms is related to the type of encounter (public *vs* private, Quine, Rutter & Arnold, 1998) but as a consequence of obtaining 'public' rewards or punishments (Netemyer & Bearden, 1992). This would be consistent with research that suggests that underlying the normative component is a system of rewards and punishments (Burnkrant & Page, 1988). Therefore, future research should be aimed at investigating the conditions under which subjective norms is superiorly predictive of intentions in comparison to attitudes and to exploring the potential processes linking subjective norms to intentions.

5.6.3. Self-efficacy and perceived control

The finding that self-efficacy added significantly to the prediction of behavioural intentions concords with previous research suggesting an important role for 'confidence' or self-efficacy in the prediction of weight management behaviour (Mullen & Holcomb, 1990; Thomson, *et al.*, 1993; Solberg *et al.*, 1997). Within the patient health related research, self-efficacy has emerged as a powerful predictor of behaviour and forms the

cornerstone of social learning theory (Bandura, 1977;1986), the health action process (Schwarzer & Fuchs, 1996) and has been incorporated into most models of health behaviour (Weinstein, 1990). Therefore, in contrast to Ajzen's conceptualisation of perceived behavioural control as a single dimension, using multiple items perceived control (the belief in the potential freedom to act) was distinguishable from self-efficacy (the belief that enactment will be successful). In previous research, perceived behavioural control has failed to form a reliable measure (eg. Ajzen & Driver, 1992; Sutton & DeVries & Glanz, 1998; Sparks *et al.*, 1992; Sparks, 1994; Wankle *et al.*, 1994). While some authors have used measures of low internal reliability (eg. Beale & Manstead, 1991; Sparks *et al.*, 1992; Manstead & Parker, 1995; Chan & Fishbein, 1993), the present study followed the lead of other researchers in treating perceived control and self-efficacy separately (Terry, 1993; Sutton *et al.*, 1998). The results of the present study are therefore in concurrence with the proposition and recent empirical support (Terry, 1993; White, *et al.*, 1994, Terry & O'Leary, 1995) that self-efficacy and perceived control may form conceptually distinct concepts. The belief that one can control the enactment of an action may differ from the belief that one can successfully execute it (Mischel *et al.*, 1996) particularly for behaviours for which external control is high (eg. I can control behavioural enactment) but perceived skill is low (eg. enactment is difficult). Therefore, the disparate findings by researchers regarding the reliability of the PBC construct may be a consequence of the type of behaviour under consideration in terms of the level of control and the level of skill required for action. However, since Ajzen (1991) argues that in situations of high control the TPB reverts to TRA the results of the present study suggest that this assumption does not necessarily hold: in situations of high control the TPB may revert to an augmented TRA with the

addition of Bandura's self-efficacy construct.

5.6.4. Theory of planned behaviour vs self-regulatory theory

The present study compared the ability of the TPB and illness cognitions for predicting practice nurses' intentions to raise the issue of weight loss with overweight patients. The results of regression analysis revealed that illness cognitions only explained 8% of the variance in intentions. Adding illness cognitions to the TPB did not result in illness cognitions predicting intentions independently of the TPB constructs. In a comparison of attitudes and illness cognitions, the single attitude dimension explained more variance in intentions that all five illness cognitions. The results suggest that the representation of attitudes in the TPB is superior to illness cognitions in predicting practice nurses' intentions to raise the issue of weight loss with overweight patients. Therefore, in contrast to the TPB, illness cognitions were weak predictors of intentions to raise the issue. However, several theoretical and methodological reasons exist for the relatively weak relationship observed between behavioural intentions and social cognitions and illness representations. First, although it could be argued that the failure of illness representations to predict intentions could be a result of 'healthy population' such an interpretation is unlikely since both attribution theory and illness cognitions have been successfully applied to the investigation of both healthy participants and observers including health professionals (Croyle & Barger, 1994). According to Leventhal's self-regulatory model (Leventhal *et al.*, 1992) the representation of a health threat leads to the initiation of a coping procedure (eg. action) and its application is therefore not confined to symptomatic populations. In explaining null results Leventhal acknowledges that beliefs may not be 'immediately relevant' and therefore will not

serve as an 'explanation' of behaviour. Illness beliefs may nevertheless be prerequisites of behavioural intentions.

However, the predictive superiority of the TPB above illness representations is consistent with a temporal ordering predicted from the TPB under which attitudes are more proximal predictors of behaviour than belief-based measures (Fishbein & Ajzen, 1975). A mediated role for illness cognitions as distal predictors of behaviour is consistent with King's (1982) original theorising and would accord well with the TPB in which positive beliefs lead to positive attitudes (Ajzen, 1991). Similarly, other theoretical models such as the health action process, postulate that threat beliefs (severity and vulnerability) underlie outcome expectancies and proceed them in temporal order (Schwarzer, 1992*a*). More unexpected was the relative lack of correlations between illness cognitions and the TPB constructs (ie. attitudes, subjective norms and perceived behavioural control) questioning their role in behaviour change. Although, it is of course entirely possible that an unmeasured 'attitude towards obesity' mediates the effects of illness cognitions on intentions, it is difficult to imagine what such a cognition would be. The most likely explanation for the poor intercorrelations between the two sets of predictors may have arisen as a consequence of belief salience. According to the theoretical assumptions underlying the theory of planned behaviour, individuals do not attend to all information and only certain information is salient at any one time (Fishbein & Ajzen, 1975). Instead the more salient to the individual the measured beliefs the higher the attitude-belief correlation (Elliott, Jobber, & Sharp, 1995). Since no research has investigated practice nurses' obesity management beliefs, it is unclear the extent to which illness cognitions underlie attitudes (ie. are part of

behavioural beliefs) and can be considered expected outcomes of own actions, particularly given the distinction between beliefs about self (ie. treatment behaviour) and beliefs about others' (ie. disease beliefs).

5.6.5. Past behaviour

The significant independent effect of past behaviour on intentions, although in contradiction to TPB (past behaviour is conceptualised as a nuisance variable), is nevertheless consistent with previous research both with health professional (Bunce & Birdi, 1998) and non-health professional samples (eg. Van der Velde & van der Plight, 1991; Rise *et al.*, 1992; Terry, 1993, Sutton, 1994; deVries, Backbier, Kok & Dijkstra, 1995). Furthermore, the explanatory potential of past behaviour has been discussed by Triandis (1977) in his attitude-behaviour model: past behaviour is conceptualised as a measure of established habit. According to Triandis, if a person has performed the behaviour in the past, then subsequent acts of the behaviour are likely to become habitual or routines. Thus, the most plausible interpretation for the observed relationship between recent behaviour and current intentions, is derived from information processing research that suggests that individuals are 'cognitive misers': hence when asked to predict future behaviour, judgements of intention are based on past behaviour since it involves less cognitive work than generating intentions from salient beliefs (Facio, 1990). Therefore, past behaviour may function as a judgemental heuristic or short cut as the information is readily accessible. Moreover, in addition to the independent effect of past behaviour on intentions, in accordance with predictions by Bunce and Birdi (1998), the present study found an interaction between past behaviour and perceived control. Past behaviour was more strongly related to intentions

under conditions of high control: perceived control was more strongly related to intentions under conditions of low control. Therefore, the results of this study are consistent with previous research which suggests that in situations of high control past behaviour may add to the prediction of intentions as a consequence of habit formation (eg. Bunce & Birdi, 1998).

5.6.6. Limitations and methodological caveats

The results of the present study should be considered with the following caveats in mind. First, in generalising the results it should be noted that while the sample of practice nurses appears representative although slightly older in age than reported elsewhere (eg. Ross *et al*, 1994); the weight ranges compare favourably with those found in the general population (Department of Health, 1992*b*). However, this does not mean that the sample was representative as to potentially important practice characteristics such as, the socioeconomic make up of the practice population, a factor that may strongly influence the propensity to raise the issue of weight loss. Second in interpreting the research findings, it should be noted that since the present study was cross-sectional causation cannot be inferred. Assuming attitudes do 'cause' behaviour, since a measure of future behaviour was not obtained and no previous research has been undertaken with practice nurses obesity management, it is unclear how well intentions are related to behaviour. Recent meta-analysis covering a wide range of behaviours report average intention-behaviour correlations between approximately 0.45 (Randall & Wolff, 1994; Godin & Kok, 1996) and 0.53 (Sheppard *et al.*, 1988). Although it is recognised that the extent to which intentions lead to behaviour varies depending on the type of behaviour under consideration (Sheppard *et al.*, 1988; Harrison *et al.*, 1992; van

Ryn, Leslie & Kirscht, 1996), there is no theoretical reason to believe that the intention-behaviour correlation of health providers' work-related behaviours would differ substantively to that reported in relation to patient health-related behaviours. Nevertheless, it is entirely possible that behaviour causes attitudes as suggested by self-perception theory (Bem, 1972) and more research is required which is both experimental and prospective.

5.6.7. Practical implications

Assuming intentions are related to behaviour the central role of self-efficacy suggests that increasing practice nurses' belief in their ability to raise the issue would be an effective means of increasing both motivation and practice. Moreover, the importance of subjective norms found in the present study suggests increasing perceptions of social pressure would be likely to increase intentions to raise the issue. However, to develop interventions, understanding both the proximal determinants of action and their more distal antecedents is necessary (Sutton, 1998*c*). An understanding of more distal determinants such as beliefs provides insights into how to change behaviour. Since normative beliefs were not measured, it is unclear where the major source of social pressure lies (eg. colleagues, patients, or both). Therefore, from a practical viewpoint drawing implications for interventions from correlational data is problematic: without manipulation causality relies on theory. However, the TPB does not explain the interrelationships between the various constructs or the relationship between illness and social cognitions. In the present study examination of squared semi-partial correlations revealed that the degree of unique variance for each significant variable was low: approximately 67% of the total explained variance was shared between the constructs.

This suggests that manipulation of one variable may have implications for the other constructs in the theory (Sutton *et al.*, 1998). Therefore, concluding that one construct should be targeted in preference to another despite a variables predictive power is difficult and limits the explanatory ability of the theory. Since, it is unclear (both theoretically and empirically) how illness representations should relate to the TPB constructs, concluding they are not worthy of investigation based on this study is difficult. Manipulation of the antecedents of proximal predictors (distal beliefs) is required if behaviour is to be changed rather than merely predicted. Therefore, the precise function of illness cognitions in behavioural decisions should be explored further.

5.7. CONCLUSIONS

To conclude, although there is growing recognition of the role of health professionals' behaviour, few studies have investigated the relationship between health professionals' beliefs and their work-related decisions using a theoretical framework. To this end the present study aimed to provide insights into factors that underlie practice nurses' decisions to raise the issue of weight loss. The results revealed that motivation to raise the issue was moderate. Therefore, providing the antecedents of behaviour can be identified, the potential exists for promoting practice nurses' intentions to raise the issue of weight loss with their patients. The TPB emerged as a useful framework in which to understand health professionals' decision-making further. Self-efficacy and subjective norms emerged as the best predictors of behavioural intentions. However, despite research that suggests that the SRM provides a useful framework with which to study illness-beliefs, the present study found that attitudes outperformed illness

cognitions in predicting practice nurses intentions. In addition, practice nurses' representations of obesity were weakly related to the attitudinal constructs contained in the TPB. Thus, questions were raised regarding the utility of illness cognitions as salient predictors of practice nurses' health promotion practices. Future research is required to clarify the role of self-efficacy and perceived control and to identify the specific antecedents of practice nurses' attitudes, subjective norms and control expectancies if useful educational interventions are to be designed.

5.8. CONCLUDING REMARKS

The results of this study revealed that (i) the TPB outperformed SRT in predicting practice nurses' intentions to raise the issue of weight loss; (ii) estimates of ability (self-efficacy) were distinguishable from estimates of task difficulty (perceived control) and (iii) self-efficacy, subjective norms, attitudes and past behaviour emerged as significant independent predictors of intentions. However, to design effective intervention requires an understanding of the precursors of the direct attitudinal measures and an indication of the main predictors of behaviour. Therefore, the next study will prospectively examine practice nurses' decision to raise the issue of weight loss using the TPB with particular emphasis on identifying belief-based antecedents of action.

Chapter 6

STUDY 3: PREDICTING HEALTH PROFESSIONALS' WEIGHT MANAGEMENT BEHAVIOUR USING THE THEORY OF PLANNED BEHAVIOUR: A PROSPECTIVE ANALYSIS

6.1. ABSTRACT

The present study aimed to prospectively examine practice nurses' decisions to raise the issue of weight loss with overweight patients. The theory of reasoned action (TRA) was compared to the theory of planned behaviour (TPB) and the role of additional variables including past behaviour, self-identity, anticipated emotional reactions and practice nurses BMI was explored. Practice nurses (N=172) completed a questionnaire about their attitudes to raising the issue of weight loss and one month later reported their behaviour (N=132). The results reveal that the TPB (with PBC conceptualised as self-efficacy) accounted for a significant increase in the variance accounted for by the TRA in both behavioural intentions and subsequent behaviour. The addition of variables external to TPB (eg. past behaviour and self-identity) accounted for a significant increase in the explained variance of intentions but not behaviour, suggesting that their effects on performance are mediated by intentions. No support was found for the role of practice nurses own BMI on either their attitudes or behaviour, except via its impact on self-identity. The results are discussed in terms of practical suggestions for intervention and theoretical implications with a particular focus on the perceived behavioural control construct and the role of past behaviour.

6.2. BACKGROUND TO STUDY

6.2.1. Theories of reasoned action and planned behaviour

According to the TRA the most proximal determinant of behaviour is the intention to perform the behaviour (see chapter three). The main determinants of intention are attitudes towards the behaviour and the extent of perceived normative pressure to perform the behaviour. In addition, the TPB includes a third predictor of behavioural decisions that of PBC. However, more recently it has been suggested that PBC may be best conceptualised as comprising of two constructs: perceived control and self-efficacy (Conner & Armitage, 1998) a finding supported with a sample of practice nurses (see chapter five). Ajzen (1991) formulated two versions of the TPB. In the first version PBC is hypothesised to influence behaviour indirectly via its impact on intentions and thus has motivational implications. In the second version PBC is hypothesised to influence behaviour directly and in such a case functions as a proxy measure for actual control. However, according to Ajzen (1988) for PBC to serve as a measure of actual control certain conditions must be met; the behaviour must be in part determined by factors beyond the persons control and PBC must be a realistic reflection of actual control.

Research suggests PBC adds to the prediction of behavioural intentions (eg. Brubaker & Wickersham, 1990; Ajzen, 1991; Netemeyer *et al.*, 1991; Godin *et al.*, 1993; Wankle *et al.*, 1994; Terry & O'Leary, 1995; Trafimow & Duran, 1998). The influence of PBC on future behaviour is less certain and several studies have failed to reveal an effect of PBC on behaviour (eg. Fishbein & Stasson, 1990; Chan & Fishbein, 1993; Giles &

Cairns, 1995; Courneya & McAuley, 1995; Trafimow & Duran, 1998). In accordance with Ajzen's (1991) predictions, the effects of PBC may be dependent on the degree of volitional control. For example, Madden *et al.*, 1992 examined 10 behaviours differing in degree of volitional control. The results revealed that PBC added to the prediction of intentions for all behaviours but only predicted behaviours for those low in perceived control. Similarly, Netemeyer *et al.* (1991) found PBC to predict intentions for voting behaviour (high volitional control) and weight loss (low volitional control) but to only impact on behaviour for behaviours lacking autonomy. However, Bagozzi and Kimmel (1995) failed to find a significant increase in variance in the prediction of exercise and dieting behaviours both of which are low in volitional control.

6.2.2. Past behaviour and perceived behavioural control

As already discussed in chapters three and five, since weight management is a behaviour repeated over time, in contradiction to the TPB the effects of past behaviour may not be fully mediated by its theoretical antecedents: intentions and perceived control in the case of behaviour and attitudes, subjective norms and perceived behavioural control in the case of intentions. However, past behaviour may only have an independent effect in situations of high control. According to Triandis' (1977) attitude-behaviour model the level of volitional control decreases as the level of habit increases predicting an intention-facilitating conditions interaction (PBC) and a past behaviour (habit) - facilitating conditions interaction. Corroborating evidence reveals that in situations of high control past behaviour adds to the prediction of intentions as expected (Bunce & Birdi, 1998), suggesting that a similar relationship will hold for the past behaviour-future behaviour correlation. Research suggests past behaviour plays more of a role in

action control with increasing experience (Maddux, 1993). Norman and Conner (1996) found PBC predicted health check attendance among first time attenders but not for previous attenders. Since for PBC to influence behaviour PBC must be realistic reflecting actual control, behaviours that are more frequently repeated are more likely to lead to accurate anticipation of barriers. Therefore, novices may be governed by intentions but as behaviour is repeated, then habit increases in importance (Bagozzi, 1981). This suggests that past behaviour may influence the extent to which PBC influences future behaviour. Valois *et al.*, (1988) found a significant habit times facilitating conditions interaction for exercise behaviour. However, the results of the latter study are unclear since the significant interaction may have been a product of the main effect of habit which was not controlled for. More recently, Montano and Taplin (1991) found an interaction between habit and intentions on the prediction of behaviour (ie. a moderating effect). Bagozzi and Kimmel (1995) found no evidence for a moderating effect of past behaviour and PBC on future dieting and exercise practices. Since obesity management can be considered a behaviour high in volitional control but contains a habitual element (ie. is repeatable over time), the present study aimed to explore the role of past behaviour, PBC and intentions on future behaviour.

6.2.3. Belief-based measures and the multiplicative rule

The TPB further proposes that attitudes are a function of beliefs concerning the consequences or outcomes of performing the behaviour (behavioural beliefs), weighted by the value placed on each of the consequences (outcome evaluations). Subjective norms are a function of perceived pressure from key referents (normative beliefs), weighted by the motivation to comply with each referent. Perceived behavioural control

is a function of beliefs about the likelihood of certain barriers to behaviour occurring (control beliefs), weighted by the power of each barrier to inhibit performance of the behaviour. The direct measures of attitudes, subjective norms and perceived control therefore assume a temporal superiority over the belief-based measures. Indeed Ajzen and Fishbein (1980) argue that beliefs are the basic determinants of behaviour and behaviour change is brought about by changing beliefs. Therefore, from a practical point of view, obtaining belief-based items that optimally predict the direct measure is necessary (Kashima & Gallois, 1993). Hence, Ajzen suggests obtaining optimal scaling coefficients (Ajzen, 1991) which permits comparisons of additive and multiplicative computational rules. However, despite the theoretical importance and practical implications optimal rescaling is rarely employed. In the few tests of the multiplicative assumption support for the computational rule has been mixed (Rise, 1992; Doll & Orth, 1993; Sutton *et al*, 1998). For example, Sutton *et al.* (1998) report that the multiplicative assumption did not hold in their study on condom use and recommend using outcome expectancies without the accompanying evaluations. Doll and Orth (1993) report that normative beliefs were better predictors than the product-sums. This study will therefore, explore the utility of the multiplicative assumption using optimal rescaling (Evans, 1991).

6.2.4. Anticipated affect

Researchers have sought to extend the TPB with the addition of a number of constructs (see Parker *et al.*, 1995; Conner & Armitage, 1998). Although direct measures of attitude are assumed to reflect affective responses, there is nevertheless a difference between whether an object is evaluated positively and whether an object makes you feel

positively (Triandis, 1977; Bagozzi, 1992). Several researchers have suggested that the TPB be extended to include anticipated affective feelings associated with the non performance of a behaviour bringing it more in line with Triandis' (1977) attitude-behaviour model. Anticipated feelings have been included in the TPB in the form of anticipated regret, a construct derived from 'regret theory' (Loomes & Sugden, 1982; Bell, 1982). Empirical support for the inclusion of anticipated regret of not performing a behaviour, has been found in relation to condom usage (Richard & van der Plight, 1991; Richard *et al.*, 1995) and driving violations (Parker *et al.*, 1995) and has explained on average an additional 10-15% in the variance in intentions. However, the usefulness of anticipated regret for some behaviours such as weight management for which the consequences for the self of nonperformance are far less severe may be questionable. Although anticipated regret is at present the only anticipated emotional reaction to be included as a direct predictor of intentions, in relation to weight management other anticipated emotional reactions such as disapproval from significant others (eg. GPs) for nonperformance may be a more likely anticipated reaction.

6.2.5. Self-identity

A second proposed extension to TPB that may be more relevant to weight management is that of self-identity. Self-identity schemas organize and guide the processing of self-related information contained in the individual's social experiences' (Markus, 1977). Recently such self-identity labels have emerged as important predictors of decisions and behaviours in other areas of attitude research (eg. Biddle *et al.*, 1987; Chang *et al.*, 1988; Sparks & Shepperd, 1992). Research suggests that individuals with a highly developed body weight schema are more likely to evaluate others' body shapes and

more likely to expect others to be as emotionally invested in their own body shapes as they themselves are (Beebe, Holmbeck, Schober, Lane & Rosa, 1996). This suggests that individuals with a strong self-identity regarding weight will place a similar focus on body weight when evaluating others and will expect others to have a strong body weight focus in their self evaluations. Therefore a strong self-identity as 'someone concerned about weight' may add to the prediction of raising the issue of weight loss.

Previous research suggests that a relationship exist between health professionals own health behaviour and their health promotion practices (Stokes & Rigotti, 1988). Overweight mental health professionals have been found to be less critical of obese clients, suggesting a relationship between health care providers' own weight and their professional behaviour (Young & Powell, 1985). However, less compelling evidence has been found for the relationship between weight and the beliefs of primary care doctors (Price *et al.*, 1987). As shown in chapter four, BMI was weakly related to practice nurses' obesity management. Since even those who are underweight may be bothered by their weight as shown by the number of underweight women who seek weight loss advice, it seems reasonable to suppose that the extent to which weight is central to one's core identity may have been a more salient factor in relation to beliefs and behaviour as opposed to absolute weight *per se*. Therefore, self-identity may mediate the effects of absolute weight on attitudes which may help to clarify the relationship between health professionals' own weight and their weight management practices.

6.3. AIMS

In summation, the TPB has not thus far been applied to the prospective investigation of practice nurses' obesity management. Therefore, the present study was designed to examine practice nurses' decisions and reported behaviour regarding raising the issue of weight loss with overweight patients using the TRA/TPB. First, this study aimed to explore the suggestion that practice nurses' beliefs vary according to their own weight. Second, since raising the issue may present problems with volitional control (ie. it is in part depended on the patient) this study aimed to compare the predictive ability of the TRA to that of the theory of TPB. In addition this study aimed to examine the role of two variables that are external to TPB anticipated emotional reactions (of nonperformance) and self-identity (weight consciousness) both of which have emerged as predictors of behaviour in other areas but have not yet been examined in relation to health professionals. Since raising the issue of weight loss can be considered a routine behaviour, the role of past behaviour in predicting both intentions and future behaviour will be examined. Finally, this study aimed to examine which beliefs discriminate between intenders and non-intenders and to test whether a multiplicative expectancy-value model is better than an additive model.

6.4. METHODOLOGY

6.4.1. PARTICIPANTS

Four FHSA's were selected from the South of England using the Directory of Health Services Authorities (1992) as a sampling frame. Participating FHSA's were: Hertfordshire; Camden & Islington and Hants (Portsmouth & South East Commission

and Southhampton & South West Commission) and Durham. Using FHSA records, 260 practices were randomly selected and one practice nurse was contacted from each practice. A structured questionnaire was mailed to the 260 practice nurses. Reminders were sent 4, 6 and 8 weeks after the first mailing. A measure of reported behaviour was obtained one month after receipt of the first questionnaire. The response rate for the initial questionnaire was 66% (*N*=172/260), of these 77% completed the behaviour questionnaire (*N*=132/172).

6.4.2. DESIGN AND PROCEDURE

A prospective questionnaire design was used. The questionnaire comprised of the following measures to assess the central components of the theory of planned behaviour. In accordance with the TPB the wording of all items were compatible in terms of the action (ie. raising the issue of weight loss); the context (ie. with all overweight patients) and the time frame (ie. during the next month). All dimensions of the theory of planned behaviour were measured on 7 point Likert scales and were operationalised and scored[27] following Ajzen's (1988; 1991) recommendations. The questionnaire was developed according to procedures outlined by Ajzen and Fishbein (1980). Telephone interviews were conducted with five practice nurses to elicit population-salient beliefs. Open-ended questions asked practice nurses to list the advantages and disadvantages of raising the issue of weight loss, to list whose views would be important in raising the issue of weight loss, and to list the kinds of things that would help or hinder their raising the issue. The five most frequently reported types of outcomes (ie. beliefs relating to the

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[27] Ajzen (1988; 1991) argues that all variables should be scored from -3 to +3 despite the finding that linear transformations of variables which involve product terms are not invariant (Evans, 1991).

possibility of successful weight loss, failure to help patients, consciousness of self, provision of services to patients and job satisfaction) were used as the basis for behavioural beliefs. The four most frequently reported referents provided the basis for normative beliefs (patients, GPs, other practice nurses and local health authority). The three most frequently reported types of barriers (eg. patients' attitudes towards weight loss, own attitudes towards weight loss, and work pressures) provided the basis for control beliefs. It is worth noting that difficulties were encountered in eliciting both disadvantages of raising the issue and factors that may facilitate raising the issue.

6.4.3. MEASURES

i) Behavioural intentions

Five items were used to assess behavioural intention. The items covered intentions (ie. *I intend to raise the issue of weight loss, I plan to raise the issue of weight loss*) anchored from 'definitely do not' to 'definitely do'; desires (ie. *I want to raise the issue of weight loss, I am committed to raising the issue of weight loss*) anchored from 'strongly disagree' to 'strongly agree'; and self-predictions (ie. *how likely is it that you will raise the issue of weight loss*) anchored from 'extremely unlikely' to 'extremely likely'. Responses were made on 7 point scales scored from -3 to +3. The five items were summed to produce a measure of behavioural intentions (Cronbach's alpha =

0.91).[28]

ii) Perceived behavioural control

In line with Ajzen's (1991) recommendations, PBC comprised of four items covering both the degree of control practice nurses believed they had over raising the issue (ie. I have complete control over whether or not I raise the issue and whether I do or do not raise the issue is entirely up to me) and the degree to which practice nurses believed they could raise the issue of weight loss (ie. I am confident that I can raise the issue of weight loss and raising the issue of weight loss will be easy).[29] Responses were made on 7 point scales anchored from 'strongly disagree' to 'strongly agree' and scored from -3 to +3. The four items did not form a reliable scale (Cronbach's alpha less than 0.65), and is in accordance with previous research which has highlighted the difficulty in constructing a reliable scales using these measures (eg. Sparks, 1994). Following suggestions (Triandis, 1977) and recent empirical support (White *et al.*, 1994, Terry & O'Leary, 1995) that perceptions of control (perceived control) and perceptions of ease (self-efficacy) are conceptually distinct dimensions, principal components analysis with varimax rotation was performed on the four control measures. The results of the factor

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[28] It has been suggested that intentions, self-predictions and desires may be considered separate dimensions (Sheppard, Warshaw & Davis, 1998; Bagozzi, 1992) where intentions are conscious plans (Ajzen, 1988), expectations are estimations of the likelihood of behaviour (Warshaw & Davis, 1985) and desires are a motivational commitment to act (Bagozzi, 1992). However, others have found such items either to load onto one factor (Conner & Sparks, 1996); to have no differential effects on routine-based behavioural outcomes (Norman & Smith, 1995); to have no differential effect of the behaviour-intention relationship over time (Randall & Wolff, 1994) or to be distinct only under certain circumstances (ie. in relation to goal pursuit, Fishbein & Stasson, 1990). Since in the present study the items formed a reliable scale the decision was made to combine them to form a single measure of intentions.

[29] According to Bandura & Cervone (1983) the 'strength' of self-efficacy (ie. confidence in ability to perform a behaviour) is a better indicator of self-efficacy than 'level' of confidence (ie. confidence in ability to perform gradients of related tasks).

analysis revealed the presence of two factors accounting for 48% and 33% of the variance respectively. Factor loadings ranged from 0.87 to 0.92 with each item loading on only one factor. Factor one comprised of the two beliefs about control over performing the behaviour and was labelled perceived control (Cronbach's alpha = 0.79) and factor two comprised of the two beliefs about ability to perform the behaviour and was labelled self-efficacy (Cronbach's alpha = 0.72). Correlations between the two items were low further supporting the distinction between control and efficacy beliefs (r=.17).[30]

iii) Behavioural control beliefs and perceived power

The belief based measure of control was assessed by asking practice nurses to indicate whether a list of eight internal and external barriers would occur if they raised the issue of weight loss.[31] The list of barriers covered patients' attitudes towards weight loss (ie. *patients have no intention to try and lose weight, patients have negative attitudes towards weight loss, patients are not motivated to lose weight*); own attitudes towards weight loss *(I am a failure at weight management, weight management is a waste of time, weight loss consultations are stressful*); and pressures of work *(I don't have enough time to offer weight loss advice, other work pressures get in the way of weight management*). Responses were made on 7 point scales anchored from 'definitely no'

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[30] Although, factors comprising of only two items may be unreliable, high loadings on only one factor and low correlations between each factor, suggests factors are worth interpretation (Tabachnick & Fidell, 1989).

[31] According to Ajzen (1991) the belief-based measures should deal with the presence or absence of resources and opportunities, together with obstacles and impediments to performance. Belief-based measures cited encompass both internal (being tired or listless, over sleeping or forgetting) and external constraints (eg. conflicting events, sickness, family obligations, employment, transportation problems, upsetting personal problems, heavy load imposed by other classes and failure to prepare class assignments) (Ajzen, 1988).

to 'definitely yes' and scored from -3 to +3. The power of each inhibitor to influence the likelihood of raising the issue was assessed by asking practice nurses to indicate how confident they were that they could overcome each of the potential barriers (eg. *I am confident I could raise the issue of weight loss despite not having enough time during surgery*) on 7 point scales anchored from 'strongly agree' to 'strongly disagree' and scored from 1 to 7.[32] The belief based measure of perceived control was calculated by multiplying the individual control beliefs with the corresponding power beliefs and summing the resulting products (Cronbach's alpha = 0.73) so that lower scores reflected fewer barriers and therefore greater control.

iv) Attitudes

A direct measure of attitude was obtained by asking practice nurses to indicate their attitude toward raising the issue of weight loss on five 7 point semantic differential scales (unimportant-important; unpleasant-pleasant; dissatisfying-satisfying; worthless-valuable; undesirable-desirable). Responses were scored from -3 to +3. The direct measure of attitude was computed as the sum of the five measures (Cronbach's alpha = 0.76).

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[32] Since it is unclear whether perceived behavioural control beliefs should be scored as either bipolar or unipolar (Ajzen, 1991) optimal rescaling (Evans, 1991) was undertaken. Optimal rescaling involves rescaling items using unstandardised regression coefficients to maximise the correlation between direct and indirect measures. Unipolar scoring of the power item was chosen since it increased the control belief-self-efficacy correlation from $r = -.20$ to $r = -.33$, while the control belief-perceived control correlation remained non-significant regardless of the scoring procedure used. These results are in accordance with those reported by Valois, Desharnais, Godin, Perron & Lecomte, 1993). However, there are problems associated with the use of optimal rescaling techniques (Miniard & Cohen, 1981). Improvements in correlations may merely reflect a scale transformation artifact that results when a positive constant is used to eliminate a negative scale value and there is a preponderance of positive referents in the data base. Given a majority of negative referents in the data base, the opposite scale transformation (ie. from unipolar to bipolar) could artificially increase correlations (Miniard & Cohen, 1981).

v) Behavioural beliefs

Behavioural beliefs were assessed by asking practice nurses to indicate whether a list of 14 consequences were likely to occur as a result of raising the issue of weight loss. The list of consequences covered beliefs about success (ie. *I will find that patients will try to lose weight, I will be successful in helping patients to lose weight, I will find patients will follow my advice*); failure (ie. *I will fail to bring about behavioural change, I will find that patients will not want to lose weight, I will be disillusioned with weight management*); consciousness of self (ie. *I will be conscious of my own eating behaviour, I will be conscious of my own weight*), provision of services to patients (ie. *I will be helping to improve patients wellbeing, I will be helping patients to avoid illness, I will be providing a service to patients*) and job satisfaction (ie. *I will get job satisfaction, I will feel my job is worthwhile, I will feel I have given advice appropriately*). Responses were made on 7 point scales anchored from 'extremely unlikely' to 'extremely likely' and scored from -3 to +3. For the measure of outcome evaluations practice nurses were asked to rate how pleasant/unpleasant they felt each of the 14 consequences of raising the issue would be on a 7 point scales anchored from 'unpleasant' to 'pleasant' and scored from -3 to +3. A measure of behavioural beliefs was calculated by multiplying the individual outcome beliefs with the corresponding outcome evaluations and then summing the resulting products (Cronbach's alpha = 0.87) so that higher scores reflected more positive beliefs.

vi) Subjective norms

Five items were used to assess subjective norms covering differing aspects of perceived social pressure (ie. personal norms, behavioural norms and subjective norms). The

items included perceived approval from others (ie. *most people who are important to me would approve of me raising the issue, most people who are important to me think I should raise the issue*) respectively anchored from 'disapprove' to 'approve' and 'extremely unlikely' to 'extremely likely'; perceptions of what others do (ie. *most other health professionals raise the issue*) anchored from 'extremely unlikely' to 'extremely likely' and perceptions of what practice nurses feel personally under pressure to do (ie. *I feel obliged to raise the issue, I feel I should raise the issue*) anchored from 'strongly disagree' to 'strongly agree'. Responses were made on 7 point scales scored from -3 to +3 (Cronbach's alpha = 0.83).[33]

vii) Normative beliefs

Beliefs about norms were assessed by asking practice nurses to indicate the likelihood that salient others think they should raise the issue of weight loss (eg. *my patients think*

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[33] Ajzen (1991) conceptualises subjective norms as perceptions of social pressure to perform the behaviour. However it is generally operationalised in terms of subjective perceptions of social approval. Cialdini *et al.* (1991) make a distinction between injunctive norms (subjective norms) and descriptive (behavioural norms) which has received empirical support (Conner, *et al.*, 1997). The addition of moral or personal norm has been shown to improve the prediction of behavioural decisions such as intentions to commit driving offences (Parker *et al.*, 1995). However, others have argued that such measures should be viewed as indicators of the same construct, that of 'perceived social pressure' (Fishbein, 1993). Conceptually and empirically it has been found useful to separate the norms people hold for themselves (personal norm) from attributed norms (behavioural and subjective norms) (Ajzen & Fishbein, 1975; Triandis, 1977). However, own norms do not develop in a social vacuum (Biddle, Bank & Slavings, 1987). Internalized norms for own behaviours are likely to be based on social norms (Biddle *et al*, 1987) although, for some behaviours it may be more important to distinguish between the different types of norms (eg. ones which involve a strong moral component). Since in the present study, the norms measured formed a reliable scale the decision was made the combine them to form a single measure of subjective norms. However, although subjective norms have been measured using what important others think one should do (Ajzen & Madden, 1986; Pender & Pender, 1986; Bish *et al.*, 1998); perceived approval or disapproval (Ajzen & Driver, 1992) the measure of subjective norms used in the present study with the original definition of the construct (Ajzen & Fishbein, 1980; Ajzen, 1988; 1991) and more recent suggestions that a broader definition encompassing perceived social pressure should be employed (Courneya & McAuley, 1995).

I should raise the issue of weight loss).[34] The four referents were: my patients, other practice nurses, doctors in my practice and my local health authority. Responses were made on 7 point scales anchored from 'extremely unlikely' to 'extremely likely' and scored from -3 to +3. Motivation to comply with referents was assessed by asking practice nurses to indicate whether they want to do what the referents think they should do (eg. *I want to do what my patients think I should do*). Responses were made on 7 point scales anchored from 'strongly disagree' to 'strongly agree' and scored from 1 to 7.[35] A measure of normative beliefs was calculated by multiplying the individual beliefs about referents with the corresponding motivations to comply and then summing the resulting products (Cronbach's alpha = 0.74).

viii) Anticipated affect

Anticipated affect was assessed by asking practice nurses to indicate how worried; regretful; tense; or guilty they would feel if during the next month they decided to wait for patients to raise the issue of weight loss before they mentioned it and is in accordance with previous research (eg. Richard & van der Plight, 1991; Richard *et al.*, 1995; Bish *et al.*, 1998). Anticipated disapproval was assessed by asking practice nurses to indicate the extent to which they would feel disapproved of or criticised by important others if during the next month they decided to wait for patients to raise the issue of

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[34] Motivation to comply was originally conceptualised and operationalised by Fishbein & Ajzen (1975; 1981) as a general willingness to comply with important referents (although later operalisations have utilised more situation-specific items, Fishbein & Ajzen, 1980, p. 269). Since research suggests that a more domain- or behaviourally-specific item has greater predictive power and does not violate the specificity assumption applied to the other constructs (Miniard & Cohen, 1981) the present study operationalised motivation to comply as domain-specific.

[35] Motivation to comply was scored 1 to 7 as it is unlikely that individuals will have a negative attitude towards salient referents (Ajzen, 1991).

weight loss before they mentioned it. All response were made on 7 point scales anchored from 'not at all' to 'extremely' and were scored 1 to 7. Anticipated regret and anticipated disapproval were combined to form a measure of anticipated negative affect (Cronbach's alpha = 0.85).

ix) Self-identity

Self-identity as someone concerned about their weight was measured with four items (I am a weight conscious person; I am someone who always tries to eat less at mealtimes that I would like to eat; I feel as though I am always trying to lose weight; I am the sort of women who likes to keep a check on her weight). Responses were made on 5 point scales anchored from 'disagree' to 'agree' and scored 1 to 5. (Cronbach's alpha = 0.72)

x) Behaviour

Past behaviour was measured with one item (during the last month I have raised the issue of weight loss with all overweight patients), responses were made on 7 point scales anchored from 'very infrequently' to 'very frequently' and scored -3 to +3. [36] One month later practice nurses were again asked to report how frequently they had raised the issue of weight loss with all overweight patients during the last month. Responses were made on 7 point scales anchored from 'very infrequently' to 'very frequently' and scored -3 to +3.

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[36] Although it has been suggested that both frequency and recency of past behaviour may be important in predicting future behaviour (Bagozzi & Warshaw, 1990), since weight management is a behaviour that is performed routinely (most practice nurses give weight loss advice at least once a week) only frequency of past behaviour was measured.

xi) Profile characteristics

Personal profile characteristics included: age and height and weight (from which body mass index (BMI) was then calculated using the formula weight kg/height m^2).

6.5. RESULTS

Data analysis

All analyses were performed using SPSS. Following data screening, sample characteristics are presented and preliminary analysis using descriptive statistics were undertaken. Differences in beliefs and reported behaviour were examined by BMI were using t-tests. For the main analysis a series of hierarchical multiple regressions were conducted. Following the theoretical structure of TPB and previous analysis (Abraham *et al.*, 1996; Orbell *et al.*,1996; Loehlin, 1992), independent variables were entered in theoretically specified stages.[37] The first set of analysis for intentions and behaviour compared the predictive[38] ability of TRA to TPB, examining whether control expectancies (self-efficacy and perceived control) significantly improved the prediction of behavioural intentions and reported behaviour after controlling for the effects of the relevant components of the TRA (attitudes and norms in the case of intentions and intentions in the case of behaviour). The next set of analysis examined the hypothesised structure of the TPB to ascertain whether the direct measures mediated the effects of the

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[37] Although adding variables in stages is a conservative analytic procedure, it is the preferred method for testing whether variables add uniquely to the prediction of intentions and or behaviour above and beyond the established theory (Terry, 1993).

[38] The terms 'predictive' and 'prediction' are used throughout this report in an analytic sense and are not meant to imply causality.

belief based measures in the case of intentions and whether intentions mediated the effects of the direct measures in the case of behaviour. The next set of analysis considered whether perceived behaviour control moderated the effects of the other components of TPB as Ajzen (1991) suggests. The final set of analysis considered whether measures external to the TPB (ie. self-identity, anticipated emotional reactions and past behaviour) added significantly to the prediction of intentions and reported behaviour after controlling for the relevant components of the theory. Those variables accounting for significant proportions of variance in dependent variables were entered into a new multiple regression and a path diagram was constructed to clarify the strength of the direct and indirect effects on reported behaviour (Bryman & Cramer, 1990), a procedure used by other researchers (eg. Abraham *et al.*, 1996; Orbell *et al.*, 1996). Finally, in line with previous researchers (eg. Brubaker & Wandersham, 1990; Rise, 1992; Sutton *et al.*, 1998) a microanalysis of beliefs was conducted using Pearson's correlation coefficient was performed in order to identify relevant beliefs which may provide a basis for possible future intervention.

6.5.1. Descriptive data and preliminary data analysis

6.5.1.1. Data screening prior to the main analysis

No item had more than 2.3% missing data. All missing items were recoded using item means (Tabachnick & Fidell, 1989). Normality was assessed using a combination of probability plots and descriptive statistics. A cutoff point of $<\pm 2$ for both skewness and kurtosis was used (George & Mallery, 1995). Results of evaluation of assumptions of

normality revealed that normality was satisfactory for all variables. Univariate outliers were searched for using a dummy dependent variable and a *z*-score of $\geq \pm 3$. No item had more that 1.7% identified as outliers. Since the number of outliers were small, loss of variance was not anticipated and outliers were therefore recoded using group means (Tabachnick & Fidell, 1989). No multivariate outliers were found using a dummy independent variables in a multiple regression and a Malahabas distance of χ^2=27.69 [1:13], $p<.01$. Inter-item correlations between all variables revealed that multicollinearity was not a problem since all correlations were less than 0.90 (Tabachnick & Fidell, 1989). Multivariate statistical analysis was therefore undertaken. The minimum case-to-independent-variable ratio was (18:1), which fell well within the 5:1 ratio which is considered adequate for conducting multiple regression (Tabachnick & Fidell, 1989).

6.5.1.2. Profile characteristics of sample

For behavioural intentions the analyses were performed on the data obtained from the first questionnaire (*N*=172/260, response rate 66%). For reported behaviour the sample size was reduced to (*N*=132) which represents a response rate of 77% of time one responders (and a overall response rate of 51%, *N*=132/260). Attrition rate analysis revealed no significant ($p<.05$) differences between practice nurses choosing to complete the second questionnaire and those who did not.[39] All practice nurses were

[39]To assess randomness of non-responders, a dummy independent variable (0 = non-responders and 1 = responders was created). Profile characteristics (ie. BMI and age) and scores on time 1 questionnaire were then used as dependent variables in a multiple regression analysis. The results revealed that neither profile characteristics or time 1 measures explained a significant amount of variance in attrition rates ($F=.70$, $p>.05$, R^2 Adj. .029) suggesting that responders were not a distinct subgroup.

female. The mean age for practice nurses was 42.80 ± 8.80 with an age range of 27-63. In total 91.7% of the practice nurses were over 30 years old. The age range of the sample concord with the age ranges of other samples reported else where (eg. Ross *et al.*, 1994). The mean body mass index for the practice nurses was 23.95 (±3.32) with 30.5% of the practice nurses being overweight (BMI > 24.9) and a further 5.4% were obese (BMI> 29.9). Practice nurses were subsequently divided into two groups on the basis of a median split (median = 23.44). This resulted in two significantly different groups (t=[2:170] -14.90; p<.001): the low BMI group had a mean BMI of 21.63 (sd.1.28) representing an average normal weight while the high BMI group had a mean of 26.11 (sd.1.48) representing an average overweight. No significant age differences by BMI were found (t=-1.43 [df=170] p>.05).

6.5.1.3. Descriptive data

Prior to performing the regression analysis, preliminary analysis comprising of means broken down by BMI and zero order correlations between the different constructs were conducted. Means for the main study variables are given in table 6.1 broken down into subgroups by BMI.

Table 6.1 : Means and standard deviations for main study variables by BMI

	Theoretical range	Overall means [s.d] $N = 172$	High BMI means [s.d] $N = 86$	Low BMI means [s.d] $N = 86$
Past behavior	-3 to +3	1.44 [1.26]	1.55 [1.11]	1.33 [1.39]
Intentions	-3 to +3	1.00 [1.25]	1.03 [.97]	1.21 [1.29]
Attitudes	-3 to +3	0.85 [.88]	0.83 [.86]	0.86 [.90]
Behaviourial beliefs	-9 to +9	1.63 [2.05]	1.74 [2.07]	1.52 [2.04]
Subjective norms	-3 to +3	1.00 [1.05]	0.98 [1.13]	1.01 [1.03]
Normative beliefs	-21 to +21	5.76 [6.02]	5.56 [6.10]	5.96 [5.96]
Self-efficacy	-3 to +3	0.66 [1.36]	0.58 [1.41]	0.75 [1.31]
Perceived control	-3 to +3	1.82 [1.18]	1.87 [1.04]	1.77 [1.32]
Control beliefs	-21 to +21	0.71[3.68]	0.62 [3.76]	0.80 [3.62]
Anticipated affect	1 to 7	4.18 [1.08]	4.11 [1.12]	4.25 [1.04]
Self-identity**	1 to 5	3.11 [1.01]	2.88 [0.98]	3.33 [0.99]
Behaviour[b]	-3 to + 3	0.91 [1.56]	0.90 [1.65]	0.93 [1.45]

Note: Since linear transformations are invariant to facilitate comparisons average sums were used for all items. [b]$N = 132$,*$p<.05$ ** $p<.01$.

As can be seen from table 6.1 the overall means for both past behavior and behavior during the study period were 1.44 [s.d. 1.26] and .91 [s.d. 1.56] respectively, suggesting that practice nurses reported raising the issue of weight loss fairly frequently. Intentions to raise the issue of weight loss were similarly reasonably high ($\bar{x}$ =1.00, sd. 1.25) with 67.4% of practice nurses scoring above the midpoint of the scale, suggesting that as a group practice nurses were motivated to raise the issue of weight loss. However there were no differences for either behaviour or intentions by BMI ($p>.05$) suggesting that both reported propensity and motivation to raise the issue of weight loss were independent of BMI.

Overall attitudes towards raising the issue of weight loss were positive ($\bar{x}$ =.85; s.d. .88)

and perceptions of social pressure strong ($\bar{x}$ =1.00; s.d. 1.08). The hypothesised antecedents of attitudes and subjective norms (behavioural beliefs and normative beliefs) were also positive ($\bar{x}$ =1.63; s.d. 2.05 and $\bar{x}$ =5.76 ;s.d. 6.02 respectively) suggesting that practice nurses were optimistic about outcomes and perceived significant support from key referents. Perceptions of control were high ($\bar{x}$=1.82, s.d. 1.18) with ratings above the midpoint, suggesting that practice nurses did not perceive raising the issue to be beyond their personal control. Although lower than perceptions of control, ratings of self-efficacy were still positive ($\bar{x}$=.66, s.d. 1.36) suggesting that practice nurses did not perceived any major barriers to performing the behaviour. Ratings of control beliefs were also reasonably high ($\bar{x}$=.71 s.d. 3.68) suggesting that overall practice nurses perceived the barriers investigated to be fairly easy to overcome. However, there were no significant group differences by BMI on any of the theory of planned behaviour constructs (p>.05), indicating that cognitions regarding raising the issue were independent of BMI.

Expectations of anticipated negative emotions for not raising the issue (anticipated regret and anticipated disapproval) were relatively neutral overall with the mean failing just above the midpoint ($\bar{x}$=4.18; s.d.1.08), suggesting that practice nurses did not anticipate strong emotional reactions as a result of not performing the behaviour. However, there were no significant group differences by BMI on ratings of anticipated emotional reactions regarding not raising the issue of weight loss (p>.05), indicating that such expectations were independent of BMI. Finally, ratings of self-identity were overall neutral ($\bar{x}$= 3.11; s.d. 1.01), suggesting that overall practice nurses perceptions of weight consciousness were nether strong nor weak. However, there was a significant

difference on ratings of self-identity by levels of BMI, with the higher BMI group reporting greater weight consciousness than the lower BMI group (t[170]=-3.03, p<.01): mean ratings of self-identity were 3.33 [0.99] and 2.88 [0.98] respectively, indicating that practice nurses with a higher BMI were more conscious of their own weight.

Zero order correlations for the main variables are given in table 6.2.

Table 6.2: Zero-order correlations between the main study variables

	Int	Att	SN	SE	PC	BB	NB	CB	PB	AA	SI
Behaviour	.56 ***	.32 ***	.41 ***	.64 ***	.02	.34 ***	.17	-.22 *	.48 ***	.04	.26 **
Intentions (Int)		.43 ***	.46 ***	.52 ***	.04	.40 ***	.37 ***	-.31 ***	.71 ***	.28 ***	.27 ***
Attitudes (Att)			.37 ***	.29 ***	.01	.57 ***	.37 ***	-.39 ***	.30 ***	.17 *	.09
Norms (SN)				.44 ***	.13	.43 ***	.56 ***	-.22 **	.33 ***	.26 ***	.18 *
Self-efficacy (SE)					.18 *	.40 ***	.29 ***	-.33 ***	.47 ***	.10	.12
Perceived control (PC)						.07	.05	-.03	-.04	-.00	-.07
Behavioural beliefs (BB)							.33 ***	-.39 ***	.31 ***	.25 ***	.19 *
Normative beliefs (NB)								-.10	.28 ***	.33 ***	.18 *
Control beliefs (CB)									-.24 **	-.01	-.10
Past behaviour (PB)										.27 ***	.17 *
Anticipated affect (AA)											.12 *
Self-identity (SI)											

To control for type 1 errors α = <.01 used as criteria for correlations to be significantly different from zero (two tailed test), **p=<.01, ***p=<.001, *p=<.05.

Correlations between the direct and indirect measures

As can be seen in table 6.2, although there was substantial intercorrelations between components of the theory of planned behaviour, as expected the highest correlations were observed between the direct measures and their hypothesised antecedents: behavioural beliefs significantly correlated with the direct measure of attitudes (r =.57, p<.001) and normative beliefs significantly correlated with the direct measure of subjective norms (r=.56, p<.001). However, although control beliefs significantly correlated with self-efficacy (r=-.33, p<.001) the correlation with perceived control was non-significant (r=-.03, p>.05). Moreover, the correlation between self-efficacy and control beliefs was lower than the control beliefs-attitudes correlation (r=-.39, p<.001) and the control beliefs-behavioural beliefs correlation (r=-.39, p<.001). This finding suggests that the control beliefs measured may overlap with negative outcome expectancies and the conceptual distinction between the two types of beliefs requires clarification. Although, the recommended elicitation procedure was followed, it is possible that key control beliefs may have been neglected.

Correlates of behaviour

Univariate analysis between the social cognition variables and behaviour, showed that raising the issue of weight loss was significantly associated with intentions to raise the issue (r=.56, p<.001), self-efficacy (r=.64, p<.001), subjective norms (r=.41, p<.001), attitudes (r=.32, p<.001), behavioural beliefs (r=.34, p<.001), control beliefs (r=-.22, p<.01) and self-identity (r=.26, p<.01). As expected, amongst the social cognition variables the highest correlates of behaviour were obtained for the hypothesised antecedents of behaviour: self-efficacy and behavioural intentions. In addition to the

hypothesised antecedents of behaviour, past behaviour significantly correlated with behaviour (r=.48, p<.001) suggesting that behaviours such as raising the issue of weight loss which are repeated frequently may lead to a temporal stability as a result of habit or routine.

Correlates of intentions

Univariate analysis between the social cognition variables and intentions, showed that intentions to raise the issue was significantly associated with self-efficacy (r=.52, p<.001), subjective norms (r=.46, p<.001), attitudes (r=.43, p<.001), behavioural beliefs (r=.40, p<.001), normative beliefs (r=.37, p<.001), control beliefs (r=.31, p<.001), anticipated negative affect (r=.28, p<.001) and self-identity (r=.27, p<.001). As expected amongst the social cognition variables, the highest correlates of intentions were the hypothesised antecedents: the direct measures of attitudes, subjective norms and self-efficacy. While the correlations between intentions were lower for the belief based measures (behavioural, normative and control beliefs). In addition to the hypothesised antecedents of intentions, past behaviour significantly correlated with intentions (r=.71, p<.001). Moreover, the past behaviour-intentions correlation (r=.71, p<.001) was higher than the past behaviour-future behaviour correlation (r=.48, p<.001) suggesting that although raising the issue of weight loss may contain a habitual or routinised element, the effect of routine may be stronger for intentions than future behaviour.

6.5.4. MAIN MULTIVARIATE ANALYSIS

6.5.4.1. HYPOTHESES FOR INTENTIONS

- If practice nurses doubt the extent to which raising the issue is under their volitional control then after controlling for TRA constructs (attitudes and subjective norms), adding PBC (self-efficacy and perceived control) will significantly increase the prediction of intentions
- If the effects of beliefs on intentions are mediated by the direct measures of the TPB (attitudes, subjective norms and PBC), then after controlling for their effects, the effects of beliefs on intentions will be non-significant.
- If PBC (self-efficacy and perceived control) differentially influence the effects of the TPB constructs on intentions, the effects of attitudes and subjective norms on intentions will be moderated by PBC so that the addition of interaction terms will add significantly to the prediction of intentions.
- If practice nurses' anticipated emotional reactions influence intentions, then after controlling for TPB, anticipated emotional reactions will add significantly to the prediction of intentions.
- If practice nurses' self-identity influence intentions, then after controlling for TPB, self-identity will add significantly to the prediction of intentions.
- If the TPB is sufficient then the effects of past behaviour on intentions will be mediated by the TPB constructs so that after controlling for attitudes, subjective norms and perceived behavioural control the effects of past behaviour will be non-significant.

- If PBC differentially influences the effects of past behaviour on intentions, the addition of interaction terms will add significantly to the prediction of intentions.

6.5.5. Regression analysis onto behavioural intentions

Comparing the theory of reasoned action to the theory of planned behaviour

For the analysis to predict intentions, the direct measure of attitude and subjective norm were entered into the first step of a hierarchical regression analysis. Self-efficacy and perceived control were then entered on the second step. This procedure allowed for an examination of whether self-efficacy and perceived control influenced behavioural intentions, after controlling for the effects of attitude and subjective norm constituting a test of the predictive ability of the theory of planned behaviour in comparison to the theory of reasoned action in predicting intentions. The results of the analysis are presented in table 6.3.

Table 6.3: Hierarchical regression analysis of the TRA and TPB onto intentions

Step	Variable	r	Sr^2	Beta	R^2ch.	R	R^2	R^2Adj.
Step 1 : Theory of reasoned action								
[1]	Attitudes	.43***	.08	.30***				
	Subjective norms	.46***	.11	.35***	.29***	.54	.29	.28
Step 2: Theory of planned behaviour								
[1]	Attitudes	.43***	.05	.25***				
	Subjective norms	.46***	.04	.22**	.29***	.54	.29	.28
[2]	Self-efficacy	.52***	.10	.36***				
	Perceived control	.04	<.01	-.06	.10***	.63	.39	.38

Beta coefficients computed after all variables entered into equation, p<.001*** p<.01** p<.05

As shown in table. 6.3, the first step of the hierarchical regression representing the TRA accounted for 28% of the variance in intentions with significant beta weights for both attitudes and subjective norms ($F[2:169]=34.77$, $p<.0001$). However, the addition of PBC (self-efficacy and perceived behavioural control) led to a significant increment in explained variance (R^2 ch. = 10%, Fch. [4:167]=13.89, $p<.0001$) and together the TPB constructs accounted for 38% of the variance in intentions. With the addition of self-efficacy and perceived control, the beta weights for both attitudes and subjective norms were slightly attenuated although they remained significant. An examination of perceptions of control revealed that only self-efficacy was uniquely contributing to the prediction of intentions: the beta weight for perceived control was not significant. Comparisons of the standardised regression coefficients indicated that self-efficacy was the most significant contributor to intentions (β =.36) followed by attitudes (β =.25) and subjective norms (β =.22). Examination of the sum of squared semipartial correlations (Sr^2) indicates that the three significant variables in combination contribute 20% in shared variability.[40] Overall, the results show that practice nurses were more likely to intend to raise the issue not only if they had a positive attitudes and perceived normative pressure to do so but if they had high confidence in their ability to raise the issue regardless of levels of perceived control. Therefore, providing support for the TPB to the extent that adding a dimension of control improves the predictive ability of the TRA.

Adding anticipated emotional reactions and self-identity

To predict intentions using an augmented model, the components of TPB (direct

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[40]Squared semipartial correlations (Sr^2) indicate the amount of R^2 attributable to unique sources. Shared variance is derived from the difference between R^2 and the sum of Sr^2 (Tabachnick & Fidell, 1989).

measure of attitude, subjective norm, self-efficacy and perceived control) were entered into the first step of a hierarchical regression analysis. Anticipated emotional reactions (anticipated regret and anticipated disapproval) and self-identity were then entered on the second step. This procedure allowed for an examination of whether self-identity and anticipated emotions influenced behavioural intentions, after controlling for the effects of the theory of planned behaviour. The results of the analysis are presented in table 6.4.

Table 6.4: Hierarchical regression analysis of the augmented TPB onto intentions

Step	Variable	r	Sr^2	Beta	R^2ch.	R	R^2	R^2Adj.
Step 3: Adding anticipated emotions and self-identity								
[1]	Attitudes	.43***	.05	.23***				
	Subjective norms	.46***	.02	.16*				
[2]	Self-efficacy	.52***	.10	.36***				
	Perceived control	.04	<.01	-.04	.39***	.63	.39	.38
[3]	Self-identity	.27***	.02	.16**				
	Anticipated affect	.28***	.02	.15*	.05**	.66	.44	.42

Beta coefficients computed after all variables entered into equation, $p<.001$*** $p<.01$** $p<.05$

As shown in table 6.4 after controlling for the effects of the TPB variables (attitude, subjective norms, self-efficacy and perceived control) self-identity and anticipated emotional reactions explained a significant increment of variance in behavioural intentions (R^2 ch.= 5%, Fch. [6:165]= 6.77, $p<.01$). The addition of self identity and anticipated emotional reactions did not change the pattern of results and the beta weights for the TPB constructs remained significant. An examination of the standardised regression coefficients for self-identity and anticipated emotional reactions

revealed that both self-identity (β =.16) and anticipated emotional reactions (β =.15) were significant predictors of intentions. Examination of the sum of squared semipartial correlations (Sr^2) indicates that the five significant variables in combination contribute 23% in shared variability. Overall, the results show that practice nurses were also more likely to intend to raise the issue if they anticipated negative emotions of not doing so and if they themselves were weight conscious. Hence the TPB constructs do not totally mediate the effects of self-identity and anticipated affect on intentions to raise the issue of weight loss.

Testing the mediational role of the direct measures

To ascertain whether the effects of the belief based measures on intentions were mediated via their effects on the direct measures as proposed by TRA, the belief based measures (behavioural beliefs, normative beliefs and control beliefs) were entered into the final step of the regression analysis. As expected after control of the direct measures, the effects of the belief based measures were non-significant (R^2 ch. =.00, Fch. [7:164] = .59, p>.05). Although the addition of the beliefs based measures slightly attenuated the beta weights of the direct measures (as a result of the high correlations) the direct measures remained significant and the pattern of results unchanged. This suggests that beliefs are mediated by the direct measures of attitudes, subjective norms and self-efficacy as proposed by the TPB and do not have a direct effect on intentions above that of the direct measures.

Testing for interactions

Since Ajzen (1991) suggests that the effects of PBC on intentions may be interactive (ie.

measures of behavioural control may moderate the effects of the other components), the interactive effects of self-efficacy and PBC were tested. After controlling for attitudes, subjective norms and perceived behavioural control, the addition of interaction terms for self-efficacy (products of self-efficacy, attitudes and subjective norms) and perceived control (products of perceived control, attitudes and subjective norms) did not result in a significant increase in explained variance (R^2ch.=.01; Fch.[11:160]=.77; p>.05). Therefore there was no support for the assertion that perceived behavioural control moderates the relationship between attitudes/subjective norms and intentions. Perceived behavioural control would therefore appear to combine additively with the other two constructs to predict intentions.

Examining the effects of past behaviour

To ascertain whether the components of the TPB fully mediate the effects of past behaviour on intentions, past behaviour was entered in the final step of a hierarchical regression analysis after controlling for attitudes, subjective norms, perceived behavioural control, self-identity and anticipated emotional reactions. The results of the analysis are shown in table 6.5.

Table 6.5: Hierarchical regression analysis of the augmented TPB and past behaviour onto intentions

Step	Variable	r	Sr^2	Beta	R^2ch.	R	R^2	R^2Adj
Step 4: Adding past behaviour								
[1]	Attitudes	.43***	.02	.17**				
	Subjective norms	.46***	.01	.13*				
[2]	Self-efficacy	.52***	.01	.15*				
	Perceived control	.04	<.01	.02				
[3]	Self-identity	.27***	.01	.13*				
	Anticipated affect	.28***	.01	.11	.44***	.66	.44	.42
[4]	Past behaviour	.71***	.18	.53***	.18***	.79	.62	.60

Beta coefficients computed after all variables entered into equation, $p<.001$*** $p<.01$** $p<.05$

As shown in table 6.5, after controlling for the effects of TPB (attitudes, subjective norms, self-efficacy, PBC), as well as self-identity and anticipated affect, past behaviour explained a significant increment of the variance in behavioural intentions (R^2 change = 18%, Fch. [7:164] = 76.98; $p<.0001$). Therefore, the effects of past behaviour on intentions were not fully mediated by social cognitions as suggested by the TPB. With the addition of past behaviour, anticipated affect was no longer significant suggesting that anticipated affect reflects past performance so that after controlling for past behaviour, anticipated affect does not influence intentions directly. The pattern of results for the other variables remained unchanged (although the beta weights were attenuated) and significant. The beta weight of self-efficacy was reduced from .36 to .13 and the unique variability (sr^2) was reduced from.10 to .01 but remained significant. The results, suggest that self-efficacy mediates some but not all the effects of past behaviour and does not merely reflect past success at raising the issue. Since, past behaviour not only added significantly to the prediction of intentions but was the most

important single predictor (β =.53), behaviours such as raising the issue of weight loss may contain a habitual or routinised element which is not fully mediated by attitudes and subjective norms. Examination of the sum of squared semipartial correlations (Sr^2) indicated that the six significant variables in combination contributed 38% in shared variability. Overall, the results showed that in addition to the cognitive predictors of intentions, practice nurses were more likely to intend to raise the issue if they had raised the issue in the past, suggesting that TPB may not be sufficient for predicting motivation to engage in routine behaviours. Bunce and Birdi (1998) suggested an interaction between perceived behavioural control and past behaviour. However, the addition of interaction terms (the products of past behaviour and self-efficacy and past behaviour and perceived control) were not significant independent predictors of intentions, possibly as a consequence of the high correlation between intentions and past behaviour.

6.5.6. Testing for direct and indirect effects on behaviour

6.5.6.1. HYPOTHESES FOR BEHAVIOUR

- If raising the issue is not completely under practice nurses volitional control then after controlling for the TRA constructs (intentions), adding PBC (perceived control and self-efficacy) will significantly increase the prediction of behaviour.
- If the effects of the TPB constructs (attitudes, subjective norms, PBC) on behaviour, are mediated by intentions then after controlling for intentions the effects of the direct measures on behaviour will be non-significant.
- If PBC (self-efficacy and perceived control) differentially influences intentions

the effects of intentions on behaviour will be moderated by PBC so that the addition of interaction terms will add significantly to the prediction of intentions.

- If anticipated emotional reactions are mediated by TPB then after controlling for intentions and PBC, anticipated emotional reactions will not add significantly to the prediction of behaviour.
- If self-identity is mediated by TPB then after controlling for intentions and PBC, self-identity will not add significantly to the prediction of behaviour.
- If the TPB is sufficient then the effects of past behaviour on reported behaviour will be mediated by the TPB constructs so that after controlling for PBC and intentions the effects of past behaviour will be non-significant.
- If PBC differentially influences the effects of past behaviour on intentions, the addition of interaction terms will add significantly to the prediction of behaviour (Bunce & Birdi, 1998).

6.5.7. Regression analysis onto behaviour

Comparing the theory of reasoned action to the theory of planned behaviour

For the analysis predicting behaviour, intentions were entered into the first step of a hierarchical regression analysis. Self-efficacy and perceived control were then entered on the second step. This procedure allowed for an examination of whether self-efficacy and perceived control influenced behaviour, after controlling for the effects of intentions constituting a test of the predictive ability of the theory of planned behaviour in comparison to the theory of reasoned action in predicting behaviour. The results of the regression analysis are shown in table 6.6.

Table 6.6: Hierarchical regression analysis of the TRA and TPB onto behaviour

Step	Variable	r	Sr^2	Beta	R^2ch.	R	R^2	R^2Adj
Step 1 : Theory of reasoned action								
[1]	Intentions	.56***	.31	.56***	.31	.56	.31	.31
Step 2: Theory of planned behaviour								
[1]	Intentions	.56***	.06	.29***	.31	.56	.31	.31
[2]	Self-efficacy	.64***	.16	.49***				
	Perceived control	.02	<.01	-.05	.16***	.69	.47	.46

Beta coefficients computed after all variables entered into equation, $p<.001$*** $p<.01$** $p<.05$

As shown in table. 6.6, the first step of the hierarchical regression, representing the TRA accounted for 30% of the variance in behaviour (F[1:130]=58.38], $p<.0001$). However, the addition of PBC (self-efficacy and perceived control) explained a significant increment of explained variance in behaviour (R^2 change = 16%, Fch. [3:128]=19.48, $p<.0001$): together intentions and perceived behavioural control accounted for 46% of the variance. With the addition of perceived behavioural control the beta weight for intentions was attenuated but remained significant: the degree of unique variance explained by intentions was reduced from 31% to 6%. An examination of perceptions of control revealed that only self-efficacy was uniquely contributing to the prediction of behaviour: the beta weight for perceived control was not significant. Comparisons of the standardized regression coefficients indicates that self-efficacy was the most significant contributor to behaviour (β =.49) followed by intentions (β =.29). Examination of the sum of squared semipartial correlations (Sr^2) indicates that the two variables in combination contribute 22% in shared variability. Overall, the results showed that practice nurses were more likely to raise the issue if they intended to do so and if they perceived themselves able to do so. Therefore, providing support for the

TPB, to the extent that adding a dimension of control improves the predictive ability of the TRA.

6.5.8. Testing the mediational role of intentions

Adding attitudes and subjective norms

To ascertain whether the univariate effects of attitudes and subjective norms on behaviour were mediated via their effects on intentions as proposed by TPB, the direct measures (attitudes and subjective norms) were entered into the third step of the regression analysis. As expected after control of intentions and perceived behavioural control the effects of attitudes and subjective norms were non-significant (R^2 ch. =.01, Fch. [5:126] = 1.48, p>.05). The Beta weights for self-efficacy and perceived behavioural control remained unchanged, whilst the beta weight for intentions was slightly attenuated but remained significant (β=.21, p<.05) suggesting that the effects of attitudes and subjective norms on behaviour are mediated by intentions as suggested by the TPB.

Adding anticipated emotional reactions and self-identity

To ascertain whether anticipated emotional reactions and self-identity were mediated by intentions as proposed by TPB, they were entered into the third step of a regression analysis after controlling for intentions, self-efficacy and perceived control. As expected after control of intentions and perceived behavioural control anticipated emotional reactions and self-identity did not did not significantly increase the amount of explained variance in behaviour (R^2 ch. =.02, Fch. [7:124] =2.10, p>.05). The Beta

weights for self-efficacy and perceived behavioural control remained unchanged, whilst the beta weight for intentions was slightly attenuated but remained significant (β=.22, $p<.05$) suggesting that the effects of emotional reactions and self-identity on behaviour are mediated by intentions as suggested by the TPB.

Testing for interaction effects

Since, Ajzen (1991) suggests that the effects of PBC on behaviour may be interactive (ie. measures of behavioural control may moderate the effects of intentions), the interactive effects of self-efficacy and PBC were tested. The addition of interaction terms for self-efficacy (product of self-efficacy and intentions) and perceived control (product of perceived control and intentions) did not result on a significant increase in explained variance (R^2ch.=.01, Fch.[6:125]=1.66;$p>.05$). Therefore there was no support for the assertion that perceived behavioural control moderates the relationship between intentions and behaviour. Perceived behavioural control would therefore appear to combine additively with intentions to predict behaviour.

Exploring the role of past behaviour

To ascertain whether the components of the TPB fully mediate the effects of past behaviour on subsequent performance, past behaviour was entered in the final step of a hierarchical regression analysis after controlling for intentions and perceived behavioural control. The results of the analysis are shown in table 6.7.

Table 6.7: Hierarchical regression analysis of the augmented TPB and past behaviour onto behaviour

Step	Variable	r	Sr^2	Beta	R^2ch.	R	R^2	R^2Adj
Step 4: Adding past behaviour								
[1]	Intentions	.56***	.03	.23*				
[2]	Self-efficacy	.64***	.14	.47***				
	Perceived control	.02	<.01	-.04	.46***	.69	.48	.46
[3]	Past behaviour	.48***	<.01	.10	.00	.69	.48	.46

Beta coefficients computed after all variables entered into equation, $p<.001$*** $p<.01$** $p<.05$*

As shown in table. 6.7, the addition of past behaviour in the final step did not lead to a significant increment in R^2 (R^2ch.=.00, Fch. [4:127]=1.19, $p>.05$). With the addition of past behaviour the beta weight for intentions was attenuated but remained significant (β reduced from .29 to .23) and the beta weights for perceived control remained unchanged. Overall, the results reveal that after controlling for TPB (intentions and perceived behavioural control) past behaviour does not add significantly to the prediction of behaviour, suggesting that the TPB is sufficient and the effects of past behaviour are mediated by self-efficacy and intentions. As suggested by Bunce & Birdi (1998) the addition of past behaviour-PBC products (perceived control and self-efficacy) revealed a significant interaction between past behaviour and perceived control explaining a marginally significant increase in R^2 of 2% ($p<.10$). However, there was no significant interaction between past behaviour and self-efficacy. Moreover, as suggested by Verplanken *et al.* (1997) the addition of the past behaviour-intention product revealed a significant interaction between past behaviour and intentions explaining a significant increase in R^2 of 2% ($p<.05$). Consideration of the regression lines for high and low control groups showed past behaviour and intentions

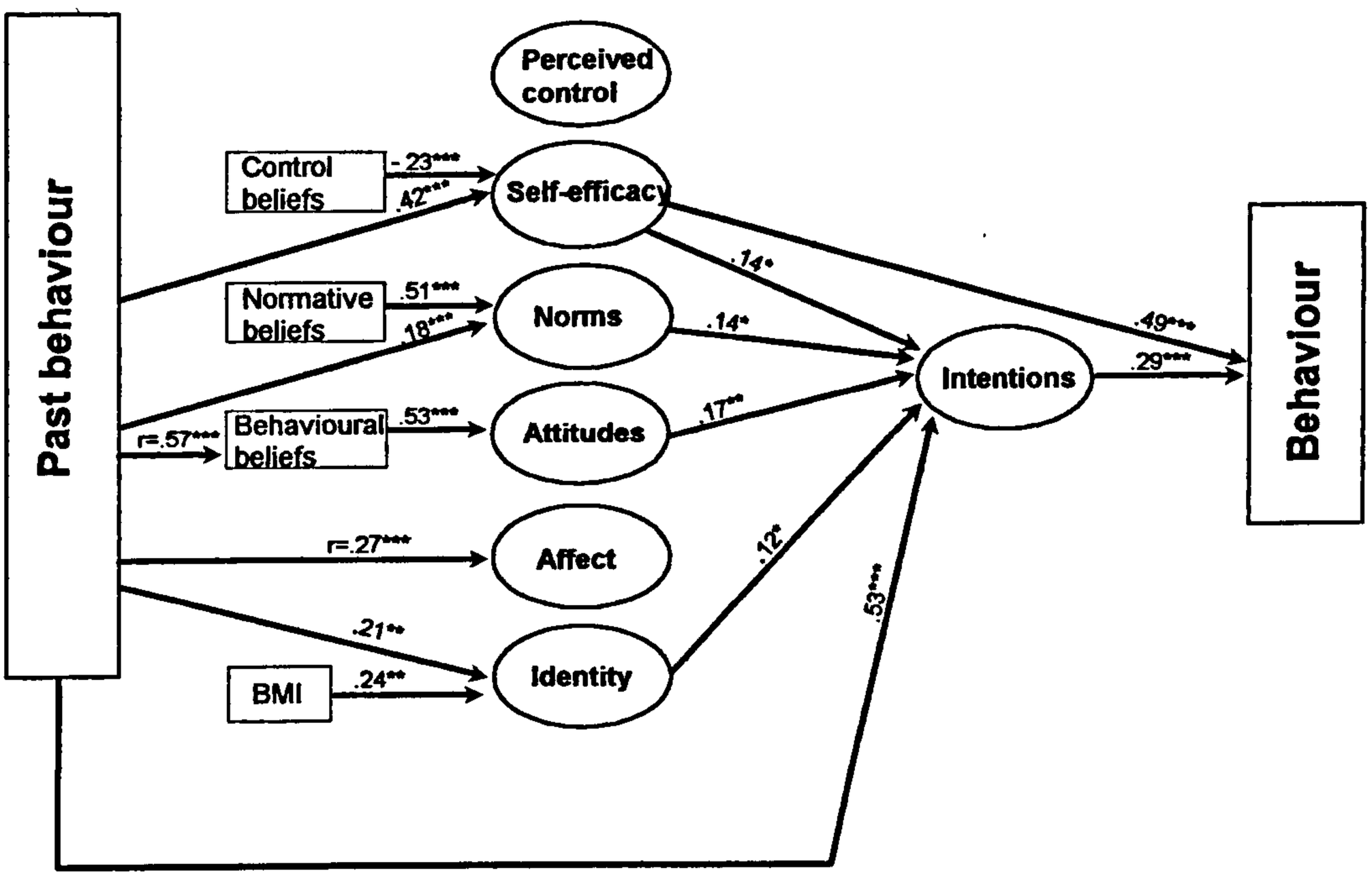
only to be significantly associated with future action under conditions of high control.

6.5.9. Path model

All significant paths were entered into a final series of multiple regressions to examine the relative importance of the direct and indirect effects on behaviour. The results are contained in fig 6.1. Paths leading to subjective norms, attitudes and perceived behavioural control (self-efficacy and perceived control) were also examined. Overall Fs were significant and standardised regression coefficients are shown for significant paths unless otherwise indicated. As can be seen from the path model, two variables (intentions and self-efficacy) are significant predictors of reported frequency of raising the issue. Collectively they accounted for 46% of variance in the dependent variable (R^2=.47, F (2:129) = 56.79 , p<.0001). Those reporting high intentions (β=.29) and self-efficacy (β=.48) were more likely to have raised the issue more frequently than those practice nurses with lower motivation and confidence. Intentions were predicted from self-efficacy, subjective norms, attitudes, self-identity and past behaviour. Collectively they accounted for 60% of variance in the dependent variable (R^2=.62 F (5:166) = 53.09, p<.0001). Practice nurses who reported intending to raise the issue frequently held more positive attitudes towards raising the issue (β=.17), had stronger perceptions of normative support (β=.14), reported feeling more confident (β=.14), rated themselves as more weight conscious (β=.12) and reported having raised the issue more frequently in the past (β=.53). Self-efficacy was predicted by control beliefs and past behaviour (R^2=.28, F (2:169) = 32.25, p<.0001). Those reporting higher levels of self-efficacy were less likely to perceived barriers towards raising the issue (β=-.23) and to be more likely to have successfully raised the issue in the previous month (β=.42). Subjective

norms were predicted by normative beliefs and past behaviours (R^2=.35, F (2:169) = 44.50, p<.0001). Practice nurses' stronger perceptions of social support were more likely to perceive support from important referents (β=.51) and were more likely to have successfully raised the issue in the previous month (β=.18). Attitudes were predicted by behavioural beliefs (R^2=.33, F (1:170) =82.63, p<.0001). Those reporting more positive attitudes were more likely to consider that raising the issue would lead to more positive outcomes (r=.57). Self-identity was predicted by past behaviour and BMI (R^2=.09, F (2:169) = 7.85, p<.001). Those who reported high levels of weight consciousness were more likely to report successfully raising the issue of weight loss in the past (β=.21) and to be themselves more overweight (β=.24).

Fig 6.1. Path model showing indirect and direct effects on reported frequency of raising the issue of weight loss with all overweight patients



*Note: Unless otherwise stated all paths contain beta weights, *p<.05, **p<.01, ***p<.001*

6.5.10. Micro-analysis of beliefs

The results of the regression analysis show that intentions are an independent predictor of reported behaviour and that attitudes, subjective norms and self-efficacy are independently predictive of intended frequency to raise the issue of weight loss with overweight patients. However, the use of direct measures does not provide an indication of what to target in an intervention. Nevertheless, such information can be obtained from the belief-based measures (behavioural beliefs, normative beliefs and control beliefs) which were found to relate to the direct measures. The correlations between the belief based measures and intentions are shown in tables 6.8 to 6.10.

Table 6.8: Zero order correlation between intentions and behavioural beliefs (beliefs about likelihood of outcomes and evaluation of outcome)

Behavioural outcome beliefs	Likelihood of outcome	Evaluation of outcome
Providing a service to patients	.45***	-.00
Improve patients well being	.42***	-.00
Helping patients avoid illness	.32***	.11
Success in helping patients lose weight	.41***	.13
Patients will follow advice	.30***	.06
Patients will try to lose weight	.25**	.08
Worthwhile job	.38***	-.06
Job satisfaction	.32***	-.04
Feel I advised appropriately	.22**	.11
Patients will not want to lose weight	-.15*	.08
Fail to change behaviour	-.12	-.03
Disillusioned with weight loss	-.13	.14
Conscious of own eating	.10	.14
Conscious of own weight	.03	.08

Correlations significantly different from zero (two tailed test), $^{**}p<.05$ ** $p<.01$ $^{***}p<.001$.

Behavioural beliefs: As can be seen in table 6.8, no significant correlations were obtained between evaluation of outcomes and intentions, suggesting that evaluations of outcomes do not vary with intentions. This may reflect low variance in measures of values compared with expectancies: practice nurses may have uniformly agreed that job satisfaction for example is desirable but differed in the extent to which they considered raising the issue would lead to job satisfaction. Such a finding is concordant with the results of tests of the multiplicative assumption underlying the belief based measures which have suggested that product-sums can sometimes be replaced by summed behavioural beliefs without loss of explained variance (eg. Sutton *et al*, 1998). This finding suggests that interventions should target beliefs as opposed to outcome evaluations.

An examination of the correlations between beliefs and intentions reveals that practice nurses with high intentions to raise the issue of weight loss frequently were more optimistic about the possibility of a successful outcome once the issue had been raised: high intentions were positively associated with higher expectations of successful weight loss (r=.41, p<.001), a stronger conviction in patients willingness to try and lose weight (r=.30, p<.001) and an increased expectation that patients would follow their weight loss advice (r=.30, p<.001). This concurs with research which suggests that positive outcome expectancies in terms of perceived success are important motivational forces (Bandura, 1977). Although beliefs about negative outcomes (eg. failure and self-consciousness) all negatively correlated with intentions, only one correlation reached significance: practice nurses who intended to raise the issue more frequently were less likely to believe that patients will not want to lose weight (r=-.15, p<.05).

The results indicate that practice nurses with high intentions to raise the issue frequently had higher expectations that raising the issue would be beneficial to patients (eg. would help them to avoid illness, r=.32, p<.001; improve their wellbeing r=.42, p<.001; and be providing a service to them, r=.45, p<.001) and would be rewarding to themselves (eg. would lead to job satisfaction, r=.32, p<.001; would make them feel their job was worthwhile, r=.38 p<.001 and that they were advising patients appropriately, r=.22, p<.01). This suggests that not only are expectations of successful weight loss and benefits to patients important correlates of intentions but that expectations regarding rewards to self in terms of job satisfaction are also related to motivation. Interventions should place greater emphasis on the benefits afforded to patients of weight loss and raise the profile of health promotion as a worthwhile part of preventative care.

Table 6.9: Zero order correlations between intentions and normative beliefs (beliefs about likelihood of referent support and motivation to comply)

Normative beliefs	Likelihood of referent support	Motivation to comply
General practitioners	.40***	.21**
Practice nurses	.31***	.21**
Health authority	.16*	.26**
Patients	.22**	-.04

Correlations significantly different from zero (two tailed test), *p<.05 **p<.01 ***p<.001

Normative beliefs: As can be seen in table 6.9, examination of the correlations between intentions and normative beliefs suggests that practice nurses with high intentions were more likely to perceive social support from all of the referents investigated but in particular GPs (r=.40, p<.001) and other practice nurses (r=.31, p<.001). This fits in

with previous research which has suggested that the practice environment may be a potential barrier to the preventive service provision (Glanz, 1997). Intentions were significantly correlated with motivation to comply both with colleagues, (ie. practice nurses , r=.21, p<.01) and GPs (r=.21, p<.01) and the local health authority (r=.26, p<.001), suggesting that a supportive working environment to giving advice could be used to increase participation. Surprisingly, motivation to comply with patients was not significantly related to intentions to raise the issue. This suggests that although weight management is a cooperative behaviour, practice nurses are not motivated to comply with patients opinions since they are actively engaged in trying to change patients behaviours. Overall, normative beliefs were positively and significantly related to intentions, suggesting that perceptions of social support and motivation to comply with referents at a structural level could be targeted in an intervention programme.

Table 6.10: Zero order correlations between intentions and behavioural control beliefs (beliefs about likelihood that barrier will occur and power of barrier to inhibit performance)

Behavioural control beliefs	Likelihood barrier will occur	Power to inhibit
Having patients with negative attitudes	-.21**	-.19*
Having patients who are not motivated	-.20**	-.18*
Having patients with no intentions to lose weight	-.10	-.13
Feeling like weight management is a waste of time	-.27***	-.04
Feeling a failure at weight management	-.07	-.04
Finding consultations stressful	-.16*	-.08
Having other work pressures	-.12	-.13
Not having enough time	-.10	-.13

Correlations significantly different from zero (two tailed test), **p<.05 ** p<.01 ***p<.001.

Control beliefs: As can be seen in table 6.10, Examination of the correlations between intentions and beliefs about barriers show that practice nurses with high intentions were less likely to expect patients to be negative about weight loss (ie. hold negative attitudes, r=-.21, p<.01 and lack motivation, r=-.20, p<.01) if they raised the issue. Low intentions were also associated with practice nurses own negative feelings (ie. likely to feel stressed, r=-.16, p<.05 and to feel that they are wasting their time, r=.27, p<.01) as a result of raising the issue. Moreover, practice nurses who were motivated to raise the issue were less likely to perceived patients attitudes as a barrier (ie. negative attitudes, r=.19, p<.05 and lack of motivation, r=.18, p<.05) to raising the issue. Surprisingly control beliefs relating to time pressure and other work pressures were not significantly related to intentions which may be due to ratings of such barriers being uniformly high: the individual control belief means were fairly high at .87 [1.53] and 1.05 [1.61] respectively. Overall, control beliefs regarding patients and practice nurses negative responses as a result of raising the issue, were inversely related to intentions, suggesting that enhancing expectations of success and patients desire for weight loss could potentially be targeted in an intervention programme.

6.6. DISCUSSION

The aim of present study was to prospectively examine practice nurses' decisions to raise the issue of weight loss with overweight patients using the TPB as a theoretical framework. The results revealed that as a professional group, the majority of practice nurses were reasonably motivated to raise the issue of weight loss and reported raising the issue fairly frequently. Attitudes towards raising the issue were positive and

perceptions of social support (particularly from other health professionals) were strong. However, although practice nurses considered raising the issue to be under their control, expectancies regarding confidence in doing so were lower: behaviour may be controllable but this does not necessarily mean that enacting it is easy. Motivation to raise the issue of weight loss was associated with expectations of positive outcomes (eg. being successful at helping patients to lose weight) but unrelated to negative behavioural beliefs (eg. failing to achieve behavioural change). Similarly, although subjective but potentially changeable barriers (eg. own and patients' negative beliefs) were inversely related to intentions, beliefs about objective potentially uncontrollable external barriers (eg. time constraints) were uncorrelated. Possibly, motivation to raise the issue is maintained via optimistic self-belief that may prevent negative expectations becoming overwhelming. No support was found for the suggestion that practice nurses own BMI influenced either their attitudes or behaviour regarding raising the issue, except via its impact on self-identity.

6.6.1. The theory of reasoned action versus the theory of planned behaviour

Regarding the relationship between beliefs and reported behaviour, the present study compared the ability of the TRA to the TPB for predicting practice nurses' intentions to raise the issue and their subsequent behaviour. The results revealed that attitudes and subjective norms predicted intentions and intentions predicted behaviour as suggested by the theory of reasoned action. However, the addition of perceived behavioural control in the form of self-efficacy (as distinct from perceived control) significantly increased the degree of explained variance in both intentions and behaviour, providing support for the TPB in terms of the necessity to include a control related dimension

(Ajzen, 1987;1991). The predictive superiority of the TPB over and above the TRA is consistent with research using both health professional (Millstein, 1996) and non-health professional samples (eg. Godin *et al.*, 1992; Terry *et al*, 1993; van der Plight & de Vries, 1995) and concords with the results of study 2 (see chapter 5).

Following recent research (eg. Sparks & Sheppard, 1992, Sutton *et al.*, 1998), the addition of variables external to the theory of planned behaviour (ie. self-identity and past behaviour) led to a significant increment in explained variance. In combination self-efficacy, attitudes, subjective norms, self-identity and past behaviour explained 61% of the variance in intentions to raise the issue: while intentions and self-efficacy explained 46% of the variance in reported behaviour. Results concord with previous research with health professional samples that has suggested an important role for self-efficacy (Mullen & Holcomb, 1990; Thomson *et al.*, 1993; Solberg *et al.*, 1997).

6.6.2. An augmented theory of planned behaviour

Consistent with evidence exploring the relationship between weight and the beliefs of primary care doctors (Price *et al.*, 1987), no support was found for the suggestion that practice nurses own BMI directly influenced either their attitudes or behaviour, except via its relationship with self-identity. Congruent with the results of studies in other behavioural domains (eg. Richard & van der Plight, 1991; Sparks & Sheppard, 1994), adding self-identity and anticipated emotional reactions (ie. measures external to the theory) significantly predicted intentions over and above the planned behaviour variables. However, the amount of additional (unique) variance explained by both self-identity and anticipated affect was small. Although, multivariately this is not surprising

given the conservative analytic procedure employed (ie. adding external variables after controlling for TPB constructs. However, previous research using a similar analytic procedure have found that both self-identity and anticipated regret added considerably to the percentage of variance accounted for.

The low amount of additional variance explained by anticipated emotion is not surprising given the type of behaviour under consideration: not raising the issue of weight loss presents low consequences for the self as indicted by the neutral ratings of disapproval and regret for nonperformance. However, the small amount of additional variance explained by self-identity is more difficult to understand. Research suggests that although all individuals exhibit a self-related body weight schema, only those with a highly developed schema show selective processing in schema relevant domains (Markus *et al.*, 1987). It is possible that weight consciousness may be more useful in understanding intentions and or behaviour in more highly related scehma domains such as choice of intervention or decisions regarding whether or not weight is an issue. With the addition of past behaviour, anticipated affect was no longer a significant predictor of intentions suggesting that, anticipated emotions may reflect past experience with the behaviour.

6.6.3. Antecedents of direct measures

The results of this study suggest intenders were more likely to be optimistic regarding patient outcomes, to consider raising the issue to be both professionally rewarding to themselves and to be beneficial and helpful for patients. However, no correlations were found between high intentions and negative outcome expectancies such as expectations

of failure, anticipated feelings of disillusionment or heightened focus on issues surrounding own weight. This suggests that beliefs about negative outcomes may not be as important as beliefs about positive outcomes when making weight management decisions. Such a finding accords with previous research that has found that positive outcome expectancies rather than negative outcome expectancies predict intentions (eg. Schwarzer & Fuchs, 1996; Quine & Rubin, 1997). Moreover, research suggests belief-based measures exist as multidimensional constructs that are distinguishable in terms of positive and negative evaluations (Bagozzi, 1981; Giles & Cairns, 1995; Sutton *et al.*, 1998). This suggests a subset of salient beliefs (ie. positive beliefs) would probably be more predictive than using the total range of beliefs (Rutter & Bunce, 1989). The results suggest that future intervention should emphasise positive beliefs in preference to minimising other potential consequences such as negative expectations that in this instance had little impact on intentions.

The correlations between PBC and the belief-based measures were lower than those for the other TPB dimensions a finding which concords with previous research (Manstead & Parker, 1995) and a recent review (Conner & Armitage, 1998) which indicate that the PBC-control belief correlations are substantively lower than for other direct and belief-based measures. Multidimensional scaling indicated a multiplicative rule was adequate and accords with previous research findings (Valois, *et al.*, 1993). However, several potential explanations exist regarding the poorer relationship between control beliefs (barriers), and the more direct measures of self-efficacy and perceived control. For example, it is possible that the control beliefs measured were not salient or relevant to the sample of practice nurses. Although this seems unlikely given that similar types

of barriers to health professionals action have been cited else where (O'Brien, 1997). Moreover, as a procedural consequence belief-based measures may not be capturing all relevant salient beliefs (Rutter & Bunce, 1989; Manstead & Parker, 1995). For example, the predictive ability of control beliefs may have been influenced by the additive approach to information integration in which several positive beliefs are proposed to be a greater incentive than one positive belief (Petty & Cacioppo, 1986). However, one barrier (eg. patients' motivation) may serve as a stronger inhibitor than several lesser barriers. Alternatively, the elicitation procedure may have prompted attributed excuses rather than real obstacles a suggestion made elsewhere regarding attributions of causation (McAuley, Poag, Gleason, & Wraith, 1990). Participants may generate excuses to preserve self-esteem in the face of failure. For example, research indicates that after failure attributions of controllability can be interpreted in terms of excusability (DeJong, Koomen & Mellenbergh, 1988). Therefore, barriers to success may be excuses for failure. Indirect support for such a suggestion is provided by investigations of the decline over time in the relationship between experience and perceived barriers to exercise (DuCharme & Brawley, 1995).

6.6.4. Past behaviour

The finding that past behaviour emerged as the strongest predictor of intentions challenges the sufficiency of the TPB for explaining intentions for behaviours repeated over time. The significant effect of past behaviour on intentions although in contradiction to TPB (which conceptualises past behaviour as a nuisance variable), is not an unusual result and is consistent with previous research with non-health professional samples (eg. Godin, Fortin, Michaud, Bradet & Kok, 1996, Rise *et al.*,

1992, Van der Velde & van der Plight, 1991, Terry, 1993, Sheeran *et al.*, 1996, Sutton, 1994). The question would appear to be how can this effect be explained? Although past experience is considered an antecedent of cognitive variables such as self-efficacy expectancies, as an independent predictor of future behaviour, past behaviour can and often is conceptualised in two distinct ways: as a nuisance variable (Ajzen, 1990) or as an explanatory variable in it's own right (Triandis, 1977). The basis for the former position assumes that since past behaviour by definition cannot be changed it's usefulness as an explanatory construct is restricted. The basis for the latter position suggests that past behaviour is a measure of habit. The concept of habit has been used to denote learned acts which have become automatic responses (Triandis, 1977). Although, as argued by Sutton, (1994) habits do not necessarily need to be automatic but may reflect behaviours which have become routine (can still choose not to perform it). Therefore, while the predictive ability of past behaviour is undisputed, its explanatory significance is a source of debate. However, the practical implication of including recent or past behaviour as an explanatory variable is that it is not amenable to change (hence the resistance to this suggestion). If past behaviour is considered a nuisance variable reflecting an unmeasured item it is difficult to imagine what this could be since the most likely candidate PBC, has failed to fully account for the effects of past behaviour (Norman &Conner, 1996).

As discussed in chapter five, several possible interpretations of the high past behaviour-intention correlation exist. First, the relationship may represent methodological problems. It may be that the scales used to assess behaviour were more similar to the scales used to assess intentions, than were the scales used to assess the other TPB

constructs. For example, the reliability of measures of intention have been shown to influence the attitude-behaviour relationship (Bagozzi, Baumgartner & Yi, 1989). However, since past behaviour was a single item and intention employed multiple items with all items measured at the same level of specificity, it is difficult to image that shared method variance could provide an adequate explanation of this finding. Alternatively, past behaviour may reflect the influence of another unmeasured variable the most likely candidate according to Ajzen (1991) being the PBC construct. However, although self-efficacy mediated some of the effects (ie. attenuated the relationship between intentions and past behaviour), past behaviour still emerged as the biggest single predictor of intentions.

The most plausible interpretation for the observed relationship between recent behaviour and current intentions is derived from information processing research that suggests that individuals are 'cognitive misers': hence when asked to predict future behaviour, judgements of intention may have been based on past behaviour which involves less cognitive work than generating intentions from salient beliefs (Fazio, 1990). Therefore, past behaviour may function as a judgemental heuristic or short cut as the information is readily accessible (see discussion in chapter eight). However, it is unlikely that past behaviour may be used as a judgemental heuristic without presumably some assessment regarding satisfaction with current levels of performance.

6.6.5. Motivation for change

It is unlikely that past behaviour may be used as a judgemental heuristic without presumably some assessment regarding satisfaction with current levels of performance

or appraisal process. High correlations between recent and later behaviour suggests behaviour is relatively stable over time. Behavioural stability presumably is due to stability of its determinants (Ajzen, 1996). It is therefore possible that resistance to change (ie. behavioural stability) is mediated by desire for, or motivation to change, which is consistent with a stage of change model of behaviour (DiClemente & Prochaska, 1987). Similarly, Bandura (1977) advocated that a related concept (satisfaction with performance) which has received little empirical investigation (see Teasdale, 1978; Bandura & Cervone, 1983 for exceptions). According to Bandura (1986) self-defined outcomes are determined through internal comparison processes. An individual compares performance to a gold standard and reacts with feelings of satisfaction of dissatisfaction. Results suggest that optimal motivation occurs when people are dissatisfied with a standard (low satisfaction) but believe it can be achieved (high self-efficacy) (Bandura & Cervone, 1983). Self-evaluation of behaviour predicted physical activity but not after controlling for past behaviour (Dzewaltowski *et al.*, 1990). Weight management is a behaviour for which personal satisfaction may be gained in two ways. First practice nurses may evaluate their current frequency of intervention and be satisfied/dissatisfied. Dissatisfaction may influence attempts to increase frequency. Second, practice nurses may be dissatisfied with the outcomes of their advice. Dissatisfaction with an expected outcome may motivate. Therefore, multiple self-evaluative processes may influence weight management behaviour such that practice nurses evaluate their behaviour and evaluate outcomes they expect to receive.

Since much health research is aimed not at adopting new behaviours but increasing the frequency of performance (eg. condom use), exploring further the link between past

behaviour and intentions (or future behaviour) seems worthwhile. For example, practice nurses who are happy with their level of service provision may not have an impetus to change. If this were so, intervention could be aimed at changing levels of perceived satisfaction with performance through for example social comparisons. Such a conceptualisation of past behaviour provides for an explanatory role in understanding its relationship to intentions or future behaviour, complimenting recent research exploring the role of 'implementation intentions' (Gollwitzer, 1993) and 'instrumental beliefs' (Bagozzi, 1992) in specifying the ways in which past behaviour may influence future performance.

6.6.6. Practical implications

As to practical implications for future intervention, the results reveal a central role for self-efficacy both in increasing intentions and service rates: self-efficacy emerged as the best predictor of intentions (after past behaviour) and of subsequent frequency of raising the issue. This suggests that increasing practice nurses' beliefs in their ability to raise the issue would be an effective means of increasing both motivation and practice. The micro-analysis of beliefs suggests that intervention could be targeted at raising the profile of the positive benefits for patients of weight loss, increasing expectations of success in helping patients to lose weight, enhancing perceptions of control over potential barriers and highlighting the perceived importance of health promotion as a preventive service, particularly within the practice environment.

6.6.7. Methodological caveats

Nevertheless, the results of the present study should be considered with the following

caveats in mind. The sample of practice nurses appears to be reasonably representative as to age ranges (eg. Ross *et al*, 1994) and although slightly lower than the general population (Department of Health, 1992*b*), the weight ranges compare favourably with those found for higher economic status females in the general population (Blaxter, 1990). No evidence was found that attrition rates were non-random. However, this does not mean that the sample was representative as to potentially important practice characteristics such as, the socioeconomic make up of the practice population, a factor that may strongly influence the propensity to raise the issue of weight loss. Moreover, as with the majority of attitudinal research the present study is limited by using single item self-report measures of behaviour. However, despite single item measures the intention-behaviour correlation of .56 compares favourably to the average intention-behaviour correlations of .53 (Sheppard *et al.*, 1988) and .45 (Randall & Wolff, 1994) reported in two recent meta analysis covering a wide range of behaviours. Therefore, the relationship between intentions and behaviour does not appear to have been undermined by using single items.

More problematic from a practical viewpoint is the general problem of drawing implications for interventions from correlational data; without manipulation causality relies on theory. However, the theory of planned behaviour does not explain the interrelationships between the various constructs: examination of squared semipartial correlations revealed that the degree of unique variance for each variable was relatively low, and between 22% and 35% of the total variance explained was shared between the constructs suggesting that manipulation of one variable may have implications for the other constructs in the theory. Moreover, since the degree of unique variance explained

by any one cognition in the final analysis of intentions was between 1% and 5%, concluding that one construct should be targeted in preference to another is difficult.

6.7. CONCLUSIONS

To conclude, although there is growing recognition of the role of health professionals in relation to patient outcomes, few studies have investigated the relationship between health professionals' beliefs and behaviour using a theoretical framework. The present study aimed to provide insights into factors that underlie practice nurses' decisions to raise the issue of weight loss. The results suggest that although levels of weight management by the primary health care team have been reported as less than optimal, practice nurses raise the issue of weight loss fairly frequently. Although, the theory of planned behaviour emerged as a useful framework in which to understand health professionals' decision making further, a distinction was found between self-efficacy and perceived control: self-efficacy emerged as the best predictor of both intentions and subsequent behaviour, suggesting that the perceived behavioural control construct requires further clarification. Consistent with research with non-health professional samples past behaviour was found to outperform the theory of planned behaviour variables in explaining intentions. As raising the issue of weight loss can be considered a routine behaviour, the role of past behaviour in predicting both intentions and future behaviour was examined and suggestions for reconceptualising past behaviour to include 'satisfaction with performance' were discussed. However, no support was found for the suggestion that practice nurses own BMI influenced either their attitudes or behaviour regarding raising the issue, except via its impact on self-identity. Finally, since the effectiveness of interventions for obesity at the level of primary care remains

low, increasing positive outcome expectancies and raising the profile of weight management were identified as potential targets for future intervention.

6.8. CONCLUDING REMARKS

This study has prospectively examined practice nurses' decision to raise the issue of weight loss using the TPB with particular emphasis on the identifying belief-based antecedents of behaviour. The results revealed that (i) self-efficacy and subjective norms were the best predictors of intentions; (ii) intentions and self-efficacy were the best predictors of behaviour; (iii) past behaviour was not an independent predictor of future action; and (iv) intentions were positively related to optimistic beliefs about the outcomes of raising the issue, support from key referents and control over negative expectancies. However, since practice nurses' beliefs and behaviours occur in the context of patients' beliefs and behaviours, the next study will examine concordance between practice nurse and patient representations of the consultation.

Chapter 7

STUDY 4: COMMUNICATION BETWEEN PRACTICE NURSE AND PATIENT: CONCORDANCE IN THE TREATMENT OF OBESITY

7.1. ABSTRACT

Research suggests that patient-provider concordance on components of the medical consultation influences' patient outcomes. The present study examined concordance between practice nurse and patient regarding aspects of the weight management consultation (information gathered, advice given, acceptability of the treatment plan and expected outcomes) using the Kappa coefficient. Matched questionnaires were completed by 62 practice nurse-patient dyads after a weight management consultation. Patients were then followed-up to assess weight loss. Results revealed discordance between the practice nurse-patient dyad regarding all aspects of the consultation investigated. The more positive practice nurses were about the consultation the greater the degree of concordance regarding information gathered and expectations for patient adherence. The more positive patients were about the consultation the more optimistic they were (relative to practice nurses) regarding acceptability of the treatment plan, outcome expectancies and the number of interventions offered. In addition, the more absolute agreement between the dyad on expectations for weight loss and the more optimistic practice nurses were (relative to patients) regarding adherence to advice, the more likely patients were to lose weight (n=26). The results are discussed in terms of understanding patients outcomes within the context of their interaction with a health professional and the communication between patient and professional advice.

7.2. BACKGROUND TO STUDY

The theoretical framework so far adopted by this thesis has assumed social behaviour is best understood as a function of the individuals' cognitive representations of reality. By focusing on individual cognitions it is assumed that an individual's level of motivation and behaviour is based on what they believe to be true rather than some objective reality. However, while predicting the clinical practice of health professionals provides insight into individual decision making, it provides no information about the patients' perception. What the health professional says (or thinks they said) is no guarantee of what is heard (Armstrong, 1984). However, a variety of explanatory models exist that may be more or less salient to either patient or provider during a consultation. Presumably what comes out of the consultation may be a product of these various perspectives. Therefore, the aim of this study is to explore the beliefs of health professionals as measured so far in the dissertation within the context of the patient.

7.2.1. Concordance

One aspect of the medical consultation that has received increasing interest is that of agreement or concordance between health care professional and patient perspectives. Where direct observation methods have been employed in conjunction with self-report, discrepancies have emerged between perceived and actual communication both on the part of the patient and the health professional. For example both doctors and patients overestimate the extent to which they have discussed important issues such as ability to follow the treatment plan (Makoul *et al.*, 1995). Differences have been found with regard to patient-provider explanatory models governing the location and function of bodily organs; the nature of viruses and germs, the understandings of particular

treatments (eg. drugs and prescribing); and the outcomes of surgical operations (Helman, 1978; Helman, 1985). Research suggests that doctors' accounts of health status and treatment preferences do not accord well with patients' own views (Wilson *et al.*, 1997). Discordance between health professional and patient has been found on a variety of aspects of medical communication including problem identification (Freidin, Goldman & Rosellen, 1980), expected outcomes (Glover *et al.*, 1996); treatment plans (Liaw, Young & Farish, 1996) and health beliefs regarding the representation of illness (Gamsu & Bradley, 1987; Boyer *et al.*, 1996).

The issue of concordance is important in the light of research that suggests a relationship between agreement and patient outcomes. It is suggested that the 'accuracy' of clinicians knowledge or assumptions about how the patient views their illness is a predictor of successful communication, compliance, and patient satisfaction in the future (Helman, 1985). Successful communication is predictive of patient satisfaction including satisfaction with the process of care, health outcomes and psychological well-being (Hardy, West & Hill, 1996). Concordance on the nature of the problem and health beliefs have been shown to promote recovery (Brody & Miller, 1986), to result in a 'less dysfunctional' consultation (Bass *et al.*, 1986), to lead to increased satisfaction for both patient and practitioner and higher levels of patient adherence (Boyer *et al.*, 1996). For example, Billing, Bar-On and Rehnqvist (1997) investigated causal attributions of patients, spouses and doctors in relation to patient outcomes after myocardial infarction. The results revealed that patients and spouses exhibited greater agreement than patients and doctors. Nevertheless, the causal attributions of each group were more important than background variables when

estimating patient subjective and objective patient outcomes. Furthermore, practitioner-patient agreement about a variety of medical problems is associated with greater expectations for improvement and with better outcomes as perceived by both patient and professional (Starfield *et al.*, 1981). However, mismatches are open to alteration. Doctors instructed to negotiate and agree with patients for diabetes onset led to greater diabetic control (Gillespie & Bradley, 1988).

7.2.2. Consultation outcomes

Since weight loss is difficult to achieve and maintain (see chapter one), the present study aimed to include a number of cognitions as indirect measures of consultation outcomes. Research within the health psychology literature suggests that optimistic beliefs regarding self-efficacy and outcome expectancies are powerful predictors of a variety of health indicators including weight loss (eg. Bernier & Avard, 1986) and may be therapeutic outcomes in their own right (Schwarzer, 1994). Within the counselling literature the acceptability of a recommendation (eg ease of compliance and the extent to which intervention is based on clients strengths) has been used as a conceptual tool for predicting the probability of implementation of counsellor recommendations (eg. Conoley *et al.*, 1994). Emphasising choice during behavioural treatment of obesity has been shown to improve therapeutic success (Mendonca & Brehm, 1983). Finally, within the medical literature patient and provider satisfaction represent important measures of quality of care emerging as predictive of adherence to treatment (eg. Woolley *et al.*, 1978; Ley, 1982; Hall, Roter & Katz, 1988) and mediating patient health outcomes (Greenfield, Kaplan & Ware, 1985). Such belief-based measures therefore have the potential to moderate the impact of health promotion on patient outcomes and provide

legitimate indicators of action.

7.3. AIMS

In summation, several potential modifiers of patient outcomes have been identified (ie. acceptability of the treatment plan, satisfaction, self-efficacious beliefs and outcome expectancies). Moreover, patient-provider concordance has been shown to affect the outcomes of medical consultations. Therefore, the present study had two aims. First, to examine the extent of concordance between practice nurse-patient dyads on the content of the weight management consultation, the type of intervention offered, acceptability of the treatment plan and expectations for outcomes. Second, to examine the relationship between degree of concordance (absolute amount of agreement) and direction of discordance (comparative amount of agreement) and patient-practitioner outcomes (self-efficacy, expected success, acceptability, satisfaction and patient weight loss).

7.4. METHODOLOGY

7.4.1. PARTICIPANTS AND DESIGN

A random subsample of 320 practice nurses from South East Thames (Lambeth, Southwark & Lewisham, Bromley, Greenwich, study one); and North West Thames (Redbridge and Waltham Forest, study three) were sent a set of two structured questionnaires comprising of one 'practice nurse questionnaire' and one 'patient questionnaire'. Follow-up reminders were sent 6 and 8 weeks after the first mailing. In total 82 practice nurses responded. The response rate was 26%. Due to missing data

from either the practice nurse (12%) or the patients (12%), 20 cases were deleted. In total 62 matched questionnaires were obtained. At three months, 26 patients who could be contacted were sent a follow-up questionnaire.

7.4.2. PROCEDURE AND MEASURES

Practice nurses were asked to recruit their 'next weight management patient' into a study about weight loss. Following the consultation, the practice nurse and patient dyad were asked to complete a matched questionnaire comprising of the following parallel items:

7.4.2.1. Content of consultation

i) Information gathered

Both practice nurse and patient were asked about the type of information gathered during the consultation. A list of questions was provided and the dyad reported what questions the practice nurse asked during the consultation. The list included information about the patients' physical health (ie. *did the practice nurse ask you about your physical health* vs *did you ask the patient about their physical health*), their psychological health (ie. *did the practice nurse ask you about how you feel* vs *did you ask the patient about they feel*), their eating behaviour (ie. *did the practice nurse ask you about your dieting behaviour* vs *did you ask the patient about their dieting behaviour*) and their motivation to lose weight. (eg. *did the practice nurse ask you about whether it was the right time for you to lose weight* vs *did you ask the patient about whether it was the right time for them to lose weight*). Examples were given to facilitate

understanding. Responses were scored either yes (1) or no (0).

ii) Advice offered

Both practice nurses and patients were asked about the type of advice given during the consultation. A list of current interventions was provided and both practice nurses and patient reported what advice was given. The list of interventions included the following: *controlling calorie intake, eating less in general, changing the content of the diet, changing the pattern of eating, substitution of certain foods for others, eating healthily and undertaking exercise.* Examples were given to facilitate understanding. Responses were scored yes (1) or no (0).

7.4.2.2. Expected outcomes

i) *Acceptability of the treatment plan*: To investigate acceptability of treatment, the dyad both rated *how easy following the advice would be for the patient*, and *the extent to which the patient was particularly interested in losing weight in the way suggested.* Responses were made on 7 point Likert scales anchored from 'not at all' (1) to 'extremely' (7).

ii) Compliance: To investigate expected outcomes of the consultation, the dyad both rated *the likelihood that the patient would follow the advice*, and *the likelihood that the patient would lose weight.* Responses were made on 7 point Likert scales anchored from 'not at all' (1) to 'extremely' (7).

In addition to the above parallel items, the dyad were asked to rate the following:

7.4.2.3. Satisfaction with the consultation

To investigate satisfaction with the consultation, the dyad both rated *how pleased they were with the consultation.* Responses were made on 7 point Likert scales anchored from 'not at all satisfied' (1) to 'extremely satisfied' (7).

7.4.2.4. Self-efficacy

Patients rated *how confident they were that they could lose weight.* Practice nurses rated *how confident they were giving advice to this patient.* Responses were made on 7 point Likert scales ranging from 'not at all confident' (1) to 'extremely confident' (7).

7.4.2.5. Profile characteristics

Finally, practice nurses were asked to provide the following profile information on themselves and the patient:

i) Practice nurses' profile characteristics

Practice nurses provided information on the following personal and professional areas: their weight and height (from which BMI was calculated), age, frequency of giving weight loss advice (less than once a week/once a week/more than once a week), duration of weight loss advice sessions (less than 5 minutes/5-10 minutes/11-20 minutes/more than 20 minutes), number of hours worked (less than 10 hours/10-20 hours/21-30 hours/more than 30 hours), whether or not they ran a weight loss clinic and whether or not they had been on a training course/seminar for weight loss.

ii) Patient profile characteristics

Practice nurses provided information on the following aspects of the patient: sex, age, weight, height, BMI and who initially suggested weight loss (practice nurse/patient other health professional).

iii) Patient weight loss at follow-up

Three months later patients were contacted and asked to report their current weight (from which BMI was calculated). Weight change and BMI change was calculated as the difference between time 1 and time 2 measures.

7.4.2.6. Discordance scores

In line with previous research (eg. Boyer *et al.*, 1996) discordance scores were calculated as follows: degree of discordance was calculated by taking patient ratings from practice nurse ratings on parallel items and re-scoring so that all numbers reflected absolute amount of agreement regardless of direction. Higher scores on degree of discordance representing higher levels of disagreement. Direction of discordance was calculated by taking patient ratings from practice nurse ratings on parallel items and reflects relative agreement. A score of zero representing total agreement, with positive and negative scores representing 'practice nurses > patients' and 'patients > practice nurses' respectively. Discordances scores for degree and direction of agreement on questions asked and advice given were then summed, while those for acceptability of treatment plan and expected outcomes were retained as single items.

7.5. RESULTS

Data analysis

All analysis was performed using SPSS. Results of evaluation of assumptions of normality revealed that normality was satisfactory for all discordance variables (Tabachnick & Fidell, 1989), using a cutoff point of $\geq \pm 2$ for both skewness and kurtosis (George & Mallery, 1995). No outliers were found using *Z* scores and a cutoff point of $\geq \pm 3$. Prior to the main analysis profile characteristics of the sample were examined using descriptive statistics and comparisons were made between responders and non-responders for both practice nurses and patients. Secondly, concordance between the dyad was evaluated using the Kappa coefficient for categorical data and the weighted Kappa (Cohen, 1968) coefficient for ordered data.[41] The weighted Kappa assigns weights to subjects depending on degree of discordance: a difference between raters of one category is less disagreement than a difference of two categories and so on. Unlike measures of association that evaluate whether a linear relationship exists between two variables, the Kappa takes account of chance agreement by comparing the difference between observed and expected agreement. The value of Kappa varies between one (perfect agreement) and zero (chance agreement). To evaluate the degree of concordance, Kappa values between 0.40 and 0.75 are considered fair to good agreement and values less than 0.40 poor agreement (Armitage & Berry, 1990). Finally, the relationships between discordance (degree and direction of), satisfaction, self-efficacy and weight loss were investigated using Pearson's correlation coefficient.

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[41] Although, Kendall's W is also an appropriate measure of concordance for ranked data, unlike Kappa it does not weight responses according to degree of discordance.

7.5.1. Profile characteristics

i) Profile characteristics of practice nurses

The mean age for practice nurses was 43.68 (sd. 9.09) with an age range of 24-68. Of these 96% were aged over 30 years old. The mean body mass index for the practice nurses was 23.53 (3.46). In total, 20.8% of the sample were currently overweight (BMI > 24.9) and of these 5.2% were obese (BMI>29.9). Overall, 76.6% of the sample reported having received some form of training in weight management. Of those receiving training in weight management, 42.2% reported running a weight loss clinic compared with 27.8% of those not receiving training. The most frequently reported working week was 10-20 hours (36.4%) with 28.6%% working more than 30 hours and only 3.9% working less than 10 hours. The majority of practice nurses reported giving weight loss advice more than once a week (83.1%) and spending more than 10 minutes on weight loss consultations (57.2%). Compared with the population of practice nurses from where the sample was drawn (see study one and three), participants reported being more frequent advisors (2.55 (.63) vs 2.80 (.47), t [1:491] = -3.23; $p<.001$) and more likely to have received training in weight management (64.6% vs 76.6%, χ^2 [1:491] = 4.37, $p<.05$). However, no significant differences were found between participants and the target population on any of the following profile characteristics measured: mean age, mean BMI, percentage running weight loss clinics, mean time spent counselling patients about weight loss or mean number of hours worked.

ii) Profile characteristics of patient sample at baseline: The mean age of patients was 48.09 (sd. 13.53) with an age range of 16-24. Of these 85.7% of the sample were more

than 30 years old. The mean BMI for patients was 34.09 (sd. 6.33), with 32% overweight (BMI≥25) and 68% obese (BMI≥30). In total 82.7% of the patients were female. Patients initiated weight loss in 40.2% of consultations versus 18.3% practice nurse initiated. No significant differences were found between males and females on age or BMI. Comparisons of profile characteristics from patients with missing data (12%) revealed no significant differences on any of the profile characteristics measured.

iii) Patient sample at follow-up: Comparisons of patient responders and non-responders at time two revealed that responders were older than non-responders (t=-2.26 (1:68) p<.05): mean age for non-responders was 45.52 (s.d.12.49) compared with 53.00 (s.d.12.46) for responders and accounted for 7% of the variance in response rates (eta^2). No other significant differences between responders and non-responders were found on any other time one variables investigated (ie. sex, BMI, agreement, expected outcomes, acceptability of treatment, satisfaction or self-efficacy).

iv) Weight loss: The mean degree of weight change over the study period was 3.65 kg (sd.10.37) resulting in a mean degree of BMI change of 1.34 BMI units (sd. 4.05).[42] Despite the mean degree of change between time one and time two being positive, suggesting that patients had successfully managed to lose weight over the study period, these changes were not significant: time one weight of 88.94 kg (sd.17.69) did not differ significantly from time two weight of 85.29 kg (s.d. 16.52) (t=1.73 [1:23], p>.05) and

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[42] Unlike weight and height at time one, weight at time two relied on patient self-report. Correlations between BMI calculated from patients self-report and BMI measured by health professionals is good (0.91) and on average estimated BMI from patients self-report is 0.77 lower than measured BMI (Little, 1998). Difference between patient estimates and actual measurements reflects both patients' overestimation of height and underestimation of weight. In the present study height was measured, in an attempt to reduce the degree of BMI underestimation.

time one BMI 33.08 (s.d. 6.91) did not differ significantly from time two BMI 31.73 (s.d. 6.36) ($t=1.63$, 1:23, $p>.05$).

7.5.2. MAIN ANALYSIS

7.5.2.1. HYPOTHESES

- First, it was hypothesised that there would be discordance on the content of the consultation between patient and practice nurse dyads.

- Second, it was hypothesised that there would be discordance on the expected outcomes of the consultation between patient and practice nurse dyads.

- Third, it was hypothesised that discordance on the content of the consultation would be related to consultation outcomes.

- Fourth, it was hypothesised that discordance on the expected outcomes of the consultation would be related to consultation outcomes.

i) Degree of concordance on content of the consultation

Table 7.1 contains percentage agreement between practice nurse and patient regarding the content of the consultation.

Table 7.1: Degree of concordance: percentage agreement on content of consultation

	Agreement			K
	Yes	No	Total	
Questions asked				
Asked about physical health	71.0%	3.2%	74.2%	.11
Asked about dieting behaviour	64.5%	6.5%	71.0%	.13
Asked about psychological health	45.2%	19.4%	64.6%	.25
Asked about motivation	53.2%	8.1%	61.3%	.03
Advice given				
Control calories	27.4%	37.1%	64.5%	.30
Eat less	33.9%	29.0%	62.9%	.26
Change content of diet	80.6%	1.6%	82.2%	.06
Change pattern of eating	32.3%	30.6%	62.9%	.26
Food substitution	72.6%	6.5%	79.1%	.26
Healthy eating	72.6%	4.8%	77.4%	.18
Exercise	66.1%	11.3%	77.4%	.35

Questions asked

As can be seen from table 7.1, 71% of the dyad both agreed that the patients' health status was discussed during the consultation. In total 22.6% of disagreement regarding questions about health largely resulted from more patients reporting being asked about their health more often in comparison to practice nurse reports. Questions regarding dieting history were agreed as occurring by 64.5% of the dyad and similar levels of disagreements were reported by both parties. The dyad agreed that psychological health was discussed in 45.2% of the consultations but was not discussed in 19.4% of the consultations. Disagreement surrounding psychological health largely resulted from

patients reporting being asked relative to practice nurse reports (24.2%). Questions regarding motivation to lose weight were agreed on as occurring by 53.2% of the dyad. Disagreement largely resulted from practice nurses reporting higher levels of questioning: in 22.6% of cases where practice nurses reported asking patients about their motivation to lose weight the patient reported that discussion did not take place. However, while overall agreement between the dyad regarding the questions asked ranged from 61.3% to 74.2%, it was not greater than chance as reflected in the low Kappa's obtained (<.4 = poor agreement). This suggests that there was little concordance between practice nurse and patient regarding the content of the consultation in terms of information gathered.

Advice given

As can be seen from table 7.1, the majority of the dyads agreed that the most frequently occurring intervention was changing the content of the patients' diet (80.6%). Substitution of snack foods for more healthy alternatives and eating healthily were both agreed as occurring by 72.6% of practice nurses and patients. While undertaking exercise was agreed as occurring by 66.1% of the dyad. Similar levels of disagreement on changing the content, substitution of snack foods and exercise were reported by both practice nurse and patient. Disagreements regarding healthy eating largely resulted from practice nurses reporting higher levels of advice (16.1%) relative to practice nurses. Advising patients to eat less in general and to control their calorie intake was agreed as occurring less frequently (33.9% and 27.4% respectively) with 37.1% agreeing that the patient was not advised to control their calorie intake. Overall, 25.8% of disagreement on calorie control resulted from patients reporting higher levels of advice

relative to practice nurses. However, while overall total agreement between the dyad regarding the types of advice given ranged from 62.9% to 82.2%, it was not greater than chance as reflected in the low Kappa's obtained (<.4 = poor agreement). This suggests that there was little concordance between practice nurse and patient regarding the type of intervention offered.

ii) Degree of concordance on expected outcomes

Table 7.2 contains percentage of agreement regarding expected outcomes of the consultation and acceptability of treatment.

Table 7. 2: Degree of concordance: percentage agreement on expected outcomes

	Agreement (agreed & differed by one) on scores >4	Grades of Agreement			K
		Differed by two or more	Differed by one	Total	
Expected compliance					
Likely to lose weight	50.82%	37.70%	49.18%	13.12%	.22
Likely to follow advice	57.38%	39.34%	36.7%	24.59%	.15
Acceptability of advice					
Easy to follow advice	47.54%	36.07%	36.07%	27.87%	.18
Interested in method	55.74%	36.07%	36.07%	26.23%	.34

As can be seen from table 7.2, 50.82% of the dyad agreed (either total agreement or differed by only 1 category) that patients would be likely to lose weight (a score of greater than 4 on a 7- point scale). Disagreements (14.75%) of more than one category were largely as a result of patients rating themselves as likely to lose weight (>4) and

practice nurses rating them as unlikely to lose weight (<4). Agreement on likelihood of following advice was higher with 57.38% of patients and practice nurses agreeing by one or fewer categories that patients would follow the advice. Disagreements (18.03%) of more than one category were largely as a result of patients rating themselves as likely to follow the advice (>4) and practice nurses rating them as unlikely to follow the advice (<4). Regarding acceptability of treatment, 55.74% of practice nurses and patients agreed (either totally agreed or differed by only one category) that patients were interested in losing weight in the way suggested. Overall, 47.54% of the dyad were in agreement (agreed by 1 or fewer categories) that the patient would easily be able to follow the advice given. Disagreements of more than one category were similar regarding ease and interest for both patient and practice nurse. Although, agreement of one category or less ranged from 61.29% to 63.94%, agreement was not greater than chance as reflected in the low weighted Kappa's obtained.[43] This suggests that there was little concordance between practice nurse and patient regarding the acceptability of the treatment plan and expected outcomes of the consultation.

ii) Correlates of discordance

Correlates of discordance (degree and direction) for practice nurses and patients are contained in table 7.3.

[43] It is possible to argue that a number on a scale is not an observable event. Therefore, even though weighted Kappa takes account of degree of agreement and does not treat agreement as absolute, the data were re-analysed with expectations scored as a dichotomous variable (1-4 scored 0 and 5-7 scored 1) without significant changes in results.

Table 7.3: Correlates of degree of discordance and direction of discordance

	Practice nurses		Patients		
	Satisfaction [n=62]	Confidence [n=62]	Satisfaction [n=62]	Confidence [n=62]	BMI change [n=26]
Correlates of degree of discordance					
Content	-.34**	-.30*	-.15	-.19	.18
Advice	-.04	.06	.06	-.14	.05
Ease	-.13	-.13	-.04	-.11	.35
Interest	.05	.04	-.03	-.07	-.38
Follow	-.26*	-.24	.19	.07	.01
Lose	-.07	-.09	-.09	-.20	-.47*
Correlates of direction of discordance					
Content	.19	.13	-.08	-.16	.08
Advice	-.05	-.01	.05	-.30*	-.22
Ease	.17	.17	-.24	-.08	.14
Interest	.10	.13	-.35*	-.20	-.27
Follow	.28*	.28*	-.33*	-.05	.50*
Lose	.09	.14	-.27*	-.54***	-.11

Note: * = $p<.05$, ** = $p<.01$, *** = $p<.001$

i) Degree of discordance and practice nurses' satisfaction and confidence

Degree of discordance on questions asked correlated negatively with practice nurses confidence (r= -.34, $p<.01$) and satisfaction with the consultation (r= -.30, $p<.05$). Therefore, the more agreement between the dyad regarding the content of the consultation, the more practice nurses rated themselves as satisfied with the consultation and confident in giving advice to the patient. Similarly, degree of discordance on expectations of following advice was negatively correlated with practice nurses

satisfaction (r=-.25, p<.05): practice nurses who rated themselves as more satisfied with the consultation, were less likely to disagree with the patient regarding expectations for adherence. However, no other significant correlations were found between degree of discordance and practice nurses' ratings of satisfaction with the consultation or confidence in giving advice.

ii) Degree of discordance and patients' satisfaction and confidence in losing weight

No significant correlations were found between degree of discordance and patents' satisfaction with the consultation or confidence in losing weight. This suggests that patients' satisfaction with the consultation and their confidence in their ability to lose weight were unrelated to level of agreement.

iii) Degree of discordance and patient weight loss at time 2

Degree of discordance on expectations for weight loss (n=26) negatively correlated with BMI change (r=-.47, p<.05): the less discordance between patient and practice nurse regarding expectations for weight loss, the higher the degree of weight change at time two. However, weight loss was not significantly correlated with degree of discordance on the content of the consultation, the type of intervention offered, acceptability of the treatment plan or expectations of adherence.

iv) *Direction of discordance and practice nurses' satisfaction and confidence*

Discordance on expectations of following advice was positively correlated with practice nurses' satisfaction (r=.28, p<.05) and practice nurses' confidence (r=.28, p<.05). Therefore in comparison to patients, the more optimistic practice nurses were regarding

patient adherence, the more satisfied practice nurses were with the consultation and the higher their ratings of confidence during the consultation. However, no other significant correlations were found between direction of discordance and practice nurses' satisfaction with the consultation or confidence in giving advice.

v) Direction of discordance and patients' satisfaction and confidence in losing weight

Patient satisfaction correlated negatively with direction of discordance on interest in weight loss method chosen (r=-.35, p<.05); likelihood of following advice (r=-.33, p<.05) and likelihood of weight loss (r=-.27, p<.05). Therefore, in comparison to practice nurses the more optimistic patients were regarding their interest in the weight loss method chosen and expected outcomes the more satisfied they were with the consultation. Similarly, patients' confidence in losing weight correlated negatively with direction of discordance on advice given (r=-.30, p<.05), and expectations of weight loss (r=-.54, p<.05). Therefore, in comparison to practice nurses the more positive patients were regarding their interest in the weight loss method chosen and expected outcomes, the more satisfied they were with the consultation. No other significant correlations were found between direction of discordance and either patients satisfaction with the consultation or confidence in losing weight.

vi) Direction of discordance and patient weight loss

Direction of discordance on expectations of following advice was positively correlated with BMI change (r=.50, p<.01): the higher practice nurses' ratings were in comparison to patients ratings the greater the degree of weight change (n=26). However, weight loss was not significantly correlated with direction of discordance on the content of the

consultation, the type of intervention offered, acceptability of the treatment plan or expectations of weight loss.

7.6. DISCUSSION

The present study aimed to examine the extent of concordance between practice nurse and patient on the content of the weight management consultation, acceptability of the treatment plan and expectations for outcomes. In addition the present study aimed to examine the relationship between discordance (both absolute agreement and comparative agreement) and self-efficacy, satisfaction and patient weight loss. The results revealed discordance between the practice nurse-patient dyad regarding all aspects of the consultation investigated. Examinations of correlates of concordance revealed that the more positive practice nurses were about the consultation the greater the degree of concordance regarding information gathered and expectations for patient adherence. Further, the more positive patients were about the consultation the more optimistic they were (relative to practice nurses) regarding acceptability of the treatment plan, outcome expectancies and the number of interventions offered. In addition, the more absolute agreement between the dyad on expectations for weight loss and the more optimistic practice nurses were (relative to patients) regarding adherence to advice, the more likely patients were to lose weight, suggesting a potential role for agreement in patient outcomes.

7.6.1. Concordance and outcomes

Regarding the relationship between concordance and outcomes the results of this study

reveal, practice nurses were more positive (more satisfied and more confident) about the consultation the greater the degree of concordance between the dyad on questions asked and patient adherence. This suggests that practice nurses may be aware of communication difficulties between themselves and the patient and may provide a potential avenue for future intervention. However, the finding that patients were more positive about the consultation the more optimistic they were (relative to practice nurses) regarding acceptability of the treatment plan, outcome expectancies and the number of interventions offered, suggests that a degree of optimism by the patient may be beneficial and belabouring communication towards complete agreement may be counterproductive. Similar findings have been reported in relation to diabetes care and concordance on health beliefs (Boyer *et al.*, 1996) and the results are consistent with the psychological literature regarding the beneficial effects of optimistic self-beliefs (Taylor & Brown, 1988; Schwarzer, 1994). However, although the degree of agreement on expectations for weight loss correlated with weight loss at time-two, patients were also more likely to lose weight the higher practice nurses' expectations for adherence were in comparison to patients. Although, the latter finding is difficult to interpret particularly in such a small sample, it is possible that practice nurses were ultimately more accurate than patients in their ratings of patient adherence. However, little is known about how health professionals develop their expectations regarding patient compliance and outcomes. Research suggests that doctors anticipate compliance when patients have clinically significant problems but are less likely to with behavioural diagnosis doctors: in other words doctors expect patients to comply when their problems are serious but treatable (Greenberg, Eisenthal & Stoeckle, 1984).

7.6.2. Potential causes of discordance

The finding of discordance between patient and provider reports are in accordance with previous research (eg. Freidin *et al.*, 1980; Liaw *et al.*, 1996). However, discordance between patient and practitioner suggests that the relationship between health promotion advice and patient outcomes may be problematic. Discordance may reflect forgetting, failure to recognise the advice given or biases in remembering (Ley, 1988) as a result of prior expectations (Glover *et al.*, 1996; Michie *et al.*, 1996; Williams *et al.*, 1998). Remembering itself contains elements of creative elaboration and selective emphasis. Mathews (1983) argues that 'the extent to which patients and practitioners successfully exchange information is affected by the degree to which their realities are mutually compatible'. However, there are intrinsic differences between lay and biomedical perspectives on illness/health that makes communication problematic (Helman, 1985). If patient and health care professional hold differing expectations or have access to different perspectives with which to interpret events then it is not surprising that differences in reporting may occur. Although some discordance may be more semantic than substantive, the existence of differing interpretations of treatments for example, suggests that communication problems may not be confined to traditional medicalised terminology. Thus even in direct observation studies it may be difficult to guarantee that what is 'said' is actually 'heard' by the patient. Such a finding is problematic for intervention studies that aim to measure adherence.

7.6.3. Implications of discordance

Therefore, it would appear that to understand variability in health professionals' behaviour and therefore variability in patient outcomes, health professionals' beliefs

need to be considered alongside patients. Practice nurses do different things based on their beliefs; patients hear different things based on their beliefs, what comes out of the consultation may be a product of these various perspectives. By placing the health professionals' beliefs within the context of the patient the present study suggests that what happens between health professional and patient may relate to both patient and health provider outcomes.

7.6.4. Methodological caveats

The present study is limited in the low response rate obtained and cannot purport to represent weight management consultations as a whole. Practice nurse profile characteristics revealed that the practice nurse sample were more frequent advisors and more likely to have undertaken a training course on weight management than the sample from which they were drawn. Moreover, only 26 patients could be contacted for information on weight loss and comparisons of patients in the follow-up group revealed that participants were older. Without research investigating profile predictors of concordance, speculation on how such unrepresentativeness may influence concordance rates is difficult. Therefore, due to the low response rate obtained the results of this study may not generalise to a representative sample of practice nurses and any conclusions drawn from the study are offered tentatively pending further research.

7.7. CONCLUSIONS

To conclude, while the present findings require replication with a more representative sample, the issue of concordance itself raises several important questions. Firstly, although prior expectations provide the most likely explication for discordance it is

unclear as to the mechanism by which discordance occurs. Secondly, from a clinical point of view, based on current research no conclusions can be drawn as to the effect of increasing concordance on patient outcomes. Thirdly, although it is generally assumed that discordance reflects communication between patient and health care providers, to date no research has evaluated the relationship between communication and discordance. While the present study cannot purport to represent weight management consultations in general, the findings accord well with research from other areas of medicine that have suggested (i) health professionals and patients disagree on key aspects of the consultation and (ii) disagreement may be useful in investigating both patient and practitioner outcomes. Finally, the results highlight that to understand the processes involved in patient-provider communication the resulting management decisions and any variability in the outcome of the consultation both patient and health professional should be considered a dyad. Such a perspective requires a more dynamic model of decision making than has previously been investigated. By placing the beliefs of both health professional and patient in the context of each other and health professionals' treatment decisions in the context of the patient, reveals that what patients take away from the consultation differs from what health professionals themselves take away. Nevertheless, both perspectives may have implications for patient-provider communication and consultation outcomes.

7.8. CONCLUDING REMARKS

Although, the previous three studies explored the role of practice nurses' cognitions in understanding treatment decisions, practice nurses' beliefs and behaviours occur in the context of patients' beliefs and behaviours. The results of this study revealed (i) patient-

provider discordance on questions asked, advice given and expected outcomes and (ii) discordance was related to both patient and provider dissatisfaction and lower levels of subsequent weight loss. Therefore, the impact of health professionals' behaviour on patient outcomes may depend upon patients' own interpretative framework. The main findings from all four studies will be discussed in more detail in the final chapter.

Chapter 8

DISCUSSION

8.1. OVERVIEW OF CHAPTER

The aim of this thesis was to explore the cognitive antecedents of health professionals' treatment decisions and to place these in the context of the patient using a combination of structured models. In the previous four chapters research investigating practice nurses' beliefs and behaviours relating to obesity and its management were presented. This chapter will discuss the main research findings and place them within a wider context. First, the role of cognitions in predicting practice nurses' weight management behaviour will be examined, particularly the relative impact of self-related beliefs about treatment behaviour and other-related beliefs about disease. Second, the theoretical implications for the theories of planned behaviour and self-regulation will be explored and the potential utility of an integrated model will be discussed. Third, the degree to which practice nurse and patient representations of the consultation concord and the role of discordance in patient outcomes will be explored. Fourth, the practical implications of the results for understanding both health promotional practice and patient outcomes will be considered and suggestions for changing health professionals' behaviour will be made. Finally, methodological caveats will be highlighted and recommendations for future research provided.

8.2. OVERVIEW OF THESIS

As shown in chapter one health promotion has become a key public health objective. This thesis therefore focused on the treatment decisions involved in the management of

obesity and began by providing an overview of the negative impact of weight on health. However, although the treatment of obesity offers the opportunity to bring about significant health gains, since obesity is a heterogeneous disorder with a complex aetiology and a high level of recidivism uncertainty remains a major barrier to effective intervention. Moreover, given the potential negative health consequences of weight variability and 'dieting', serious consideration must be given to the possibility that weight-reduction treatments that confer only transient effects may be hazardous to health. Therefore, weight management is both problematic and time consuming. Hence, health professionals require a proactive but sympathetic and flexible treatment approach accompanied with sustained follow-up. This thesis therefore focused on practice nurses as the health professionals positioned at the forefront of delivering preventive services.

As discussed in chapter two focusing attention on the role of the health professional as agent of change locates treatment decisions and service delivery as the first step in understanding the weight management process. However, the available evidence although sparse suggests lifestyle counselling in primary care is less than optimal. The existence of systematic variability as revealed by a developing literature investigating clinical behaviour underscores the necessity for a full explication of provider decisions. However, research investigating antecedents of variability in health professionals' obesity management behaviour to date have been non-systematic and relatively marginal. Consequently, methodological caveats and the absence of theoretically driven research make theoretical elaboration and intervention development problematic.

In contrast, as shown in chapter three within the field of patient health-related behaviour, a variety of behavioural-decision models have been developed and are accompanied by a systematic body of research. Although each model contains a number of different constructs the conceptual overlap between dimensions suggests many are functionally analogous. In a review of the main decision-making models two representational schema were distinguishable: the representation of own behaviour and the representation of disease. As applied to health professionals, this gave rise to a distinction between self-related cognitions (beliefs about own treatment behaviour) and other-related cognitions (beliefs about patients disease onset, consequences, controllability and coping efforts). An integrated decision model was proposed which included the following constructs: (i) motivations (ie. intentions); (ii) threat perceptions (ie. severity and susceptibility); (iii) action-outcome expectancies; (iv) attributions for disease onset; (v) attributions for disease recovery; (vi) control expectancies encompassing both perceptions of control over own behaviour (self-efficacy) and estimates of task difficulty (perceived control) and (vii) past behaviour as a measure of routine. This thesis therefore aimed to explore the relationship between self-related and other-related cognitions with regard to practice nurses' obesity management using an integrated conceptual framework.

While a focus on health professionals' cognitions attempts to integrate the 'patient' into decision-making via the representation of disease and recovery, it fails to take account of the context in which the providers' beliefs and decisions occur (ie. the consultation). Within the medical literature communication between patient and provider has been explored using the concept of concordance. This thesis therefore sought to explore

concordance between provider and patient regarding aspects of the weight management consultation (ie. information gathered and advice given) and patient-provider outcomes (ie. satisfaction, treatment acceptability, expected compliance and weight loss).

8.3. SUMMARY OF MAIN RESEARCH FINDINGS

Therefore in chapters four to seven, four empirical studies were presented which aimed to examine the cognitive predictors of practice nurses' management of obesity. Study one explored the relationship between practice nurses' beliefs about obesity, behavioural expectancies and involvement in obesity management including their choice of weight management intervention (see chapter four). Overall beliefs about obesity were poor correlates of practice nurses' weight management decisions in comparison to behavioural expectancies. However, since behavioural intentions have emerged as important moderators of the attitude-behaviour relationship, study two compared the predictive power of the representation of illness as defined by self-regulatory theory (SRT) and the representation of behaviour as conceptualised by the theory of planned behaviour (TPB) in predicting practice nurses' intentions (see chapter five). Overall, the results revealed that (i) the TPB outperformed SRT in predicting practice nurses' intentions to raise the issue of weight loss; (ii) estimates of ability (self-efficacy) were distinguishable from estimates of task difficulty (perceived control) and iii) self-efficacy, subjective norms, attitudes and past behaviour emerged as significant independent predictors of intentions. However, since to design effective intervention requires an understanding of the relationship between beliefs and behaviour, study three prospectively examined practice nurses' decision to raise the issue of weight loss using the TPB with particular emphasis on identifying the belief-based antecedents of

behaviour (see chapter six). The results revealed that (i) self-efficacy and subjective norms were the best predictors of intentions; (ii) intentions and self-efficacy were the best predictors of behaviour and (iii) past behaviour had no independent effect on future action. However, since practice nurses' beliefs and behaviours occur in the context of patients' beliefs and behaviours, the final study examined concordance between practice nurse and patient regarding the content of the interaction, satisfaction with the consultation and expectations for success using matched questionnaires (see chapter seven). Patients' weight was recorded 3-months later. Overall, the results revealed (i) patient-provider discordance on questions asked, advice given and expected outcomes and (ii) discordance was related to both patient and provider dissatisfaction and lower reported levels of subsequent weight loss at time two. The main findings will be discussed in more detail below.

8.4. COGNITIVE PREDICTORS OF PRACTICE NURSES' OBESITY MANAGEMENT

8.4.1. THE REPRESENTATION OF ILLNESS

Overall, the results of this thesis suggest that disease-related cognitions were poor predictors of practice nurses' obesity management behaviour. In study one practice nurses' beliefs about obesity (ie. obesity onset, health consequences, time-line and control over recovery) were poor correlates of the degree of involvement in clinical practice. In study two univariate analysis revealed illness cognitions were unrelated to past behaviour and few correlations emerged between illness cognitions and intentions to raise the issue of weight loss. In multivariate regression analysis the representation

of obesity as defined by the self-regulatory model explained less than 10% of the variance in practice nurses intentions to raise the issue, with only symptom severity emerging as an independent predictor of decisions. This is consistent with the limited research that has so far been conducted showing providers' beliefs about obesity to be largely unrelated to their weight management and dietary counselling practices (eg. Thomson *et al.*, 1993).

While the results of this thesis are consistent with the representation of obesity being a poor predictor of propensity to provide obesity counselling, mixed evidence suggested that the representation of obesity was associated with intervention choice. Specifically, in study one attributions regarding obesity onset and control correlated with selecting treatment methods. Similarly, within the patient health arena illness cognitions have been related to specific types of coping strategies (eg. controllability with planning) although the correlates were only moderate (Moss-Morris *et al.*, 1996). This would appear to indicate that different types of decisions may require different sets of predictors (eg. van Ryn *et al.*, 1996) and is consistent with recent theoretical developments suggesting different antecedents depending on stage in decision-making (Weinstein, 1988; Bagozzi, 1992; Schwarzer, 1992*a*). Therefore, although disease-related cognitions may not be needed if (i) trying to predict the frequency or intensity of health professionals' behaviour or (ii) in the face of a pre-existing minimum level of performance, they may nevertheless be important in the selection of initial behavioural goals. Future research should explore the role of beliefs about disease across different types of treatment decisions.

8.4.2. THE REPRESENTATION OF TREATMENT BEHAVIOUR

In comparison to the representation of obesity, the representation of treatment behaviour explored in this thesis was consistently related to practice nurses' decisions. For example, in study one both self-efficacy and perceived success emerged as the only significant correlates of frequency of giving advice and time spent counselling patients about weight loss and dietary change. Both self-efficacy and perceived success represent self-related beliefs about behaviour: self-efficacy represents the belief that one can perform the behaviour and perceived success the belief that if one does a desirable outcome will occur. In studies two and three positive attitudes towards raising the issue, high levels of self-efficacy and supportive subjective norms were the best predictors of intentions. Positive intentions and high self-efficacy were the best predictors of future behaviour in study three. Therefore, the results of this thesis suggest beliefs about behaviour are related to health professionals' treatment decisions. This is consistent with research examining other health professional groups across a variety of clinical behaviours. For example, beliefs about own behaviour (in particular perceived norms and control expectancies) have emerged as predictors of health professionals' treatment practices (eg. Renfroe *et al.*, 1990; Godin *et al.*, 1992; Nash *et al.*, 1993; Vermette & Godin, 1996) including health promotion counselling for safer sex (Ngomuo *et al.*, 1995; Millstein, 1996) and weight management (Price *et al.*, 1987; Mullen & Holcomb, 1990; Thomson *et al.*, 1993; Glanz *et al.*, 1995). Therefore, the disparity between provider beliefs and weight control behaviours reported in previous research (eg. Levine *et al.*, 1993; Kushner, 1995; Heywood *et al.*, 1996; Solberg *et al.*, 1997) is likely to be methodological arising as a consequence of using general attitudes to try to predict specific behaviours. Since research suggests attitudes to care management, influences

all stages of decision making including information gathering, needs assessment and intervention choice (Conning & Rowland, 1992) future research should further explore the role of providers' beliefs throughout the decision-making process.

8.4.3. THEORETICAL COMPARISON OF THE TPB AND SRM

Study two compared the ability of the TPB and the SRM for predicting practice nurses' intentions to raise the issue of weight loss with overweight patients. The results revealed that the SRM did not add significantly to the prediction of intentions after controlling for the TPB. In a multiple regression analysis beliefs about own behaviour fully mediated the impact of disease-related beliefs on practice nurses' decisions to raise the issue. In addition, a direct comparison of attitudes and illness cognitions revealed that the single attitude dimension as defined by the TPB explained more variance in intentions that all five illness cognitions. Therefore, consistent with the interpretation of the results derived from studies one and three, the results of study two indicate that the representation of behaviour is superior to beliefs about disease in predicting practice nurses' intentions to raise the issue of weight loss with overweight patients. Specifically, in comparison to the TPB, illness cognitions (SRM) were weak predictors of intentions to raise the issue and were fully mediated by self-related beliefs. Overall, the results of this thesis suggest that self-related cognitions (beliefs about own treatment behaviour) were better predictors of involvement in obesity management than other-related beliefs about obesity and its control: beliefs about obesity as defined by the self-regulatory model were poor proximal predictors of practice nurses' decisions in comparison to beliefs about behaviour as defined by the theory of planned behaviour. Therefore, social cognition models that prioritise self-related behavioural expectancies as the most

proximal predictors of action control (eg. TRA/TPB, SCT, ATHB) would appear to provide a better conceptual framework for predicting health professionals' treatment decisions than those that emphasise illness cognitions (eg. HBM, SRT).

8.5. THEORETICAL IMPLICATIONS FOR THE SRM

The results of this thesis therefore suggest that self-related cognitions (beliefs about own behaviour) were better predictors of behavioural decisions than other-related beliefs about disease and recovery. This pattern of findings concords with those obtained in other studies of health promotion activities where beliefs about self-efficacy and outcome expectancies have emerged as the most prominent correlates of medical practice (eg. Thomson *et al.*, 1993; Mullen & Holcomb, 1990; Solberg, *et al.*, 1997). Therefore, to predict health professionals' behaviour, an integration of the theories of planned behaviour and self-regulation may not be necessary: the context of provider beliefs about either disease or attributions for patient recovery may not be necessary to understand provider action. However, given that health professionals' behaviour could be expected to involve both the representation of disease and the representation of treatment behaviour, the poorer predictive power of illness cognitions relative to behavioural expectancies requires elaboration.

8.5.1. EXPLANATIONS FOR THE WEAKER PREDICTIVE POWER OF SRM

Methodological explanations

According to the SRM, cognitions about obesity should be predictive of behaviour (or behavioural decisions, Leventhal *et al.*, 1997). Therefore, illness cognitions may have

been unrelated to practice nurses' behaviour as a consequence of methodological problems. First, although the items used to operationalise illness cognitions were internally reliable they may not necessarily have been valid indicators of the proposed constructs. However, this interpretation seems unlikely since the items were based on the Illness Perceptions Questionnaire (Weinman *et al.*, 1996) and the factors were consistent both with previous research (eg. Turk *et al.*, 1986; Bishop, 1991; Schiaffino & Cea, 1995; Swartzman & Lees, 1996) and across two different samples (ie. studies one and two). Moreover, although the factor analytic approach adopted is consistent with the above cited research, it differs from that recommended by Weinman *et al.* (1996): illness cognitions do not have to be reliable as they are not thought to represent a factor structure.[45] However, using reliable measures of beliefs is unlikely to decrease inter-item correlations as method variance will be reduced: using reliable multi-item measures, inter-item correlations are unlikely to be deflated. Therefore, the weak predictive power of the SRM is unlikely to be a consequence of the operalisation of the constructs.

A second but related methodological issue pertains to the actual measurement of the individual beliefs themselves. For example, it has been argued in relation to the HBM that beliefs about threat should be made contingent on action or inaction (Ronis, 1992; Abraham & Sheeran, 1996; van der Plight, 1998). Unconditional risk estimates permit idiosyncratic interpretation of measures as a consequence of anchoring using current behavioural status (Weinstein & Nicolich, 1993; Weinstein, 1993). However, the

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[45] This is the same assumption that underlies the behavioural beliefs in the TPB.

obesity-related beliefs used in this thesis were framed in terms of patients continuing to be obese (implying health professionals' inaction). Therefore, since the rationale for making threat expectancies conditional on own action is to reduce the impact of the effects of past behaviour on future estimates this is clearly inapplicable to 'observers' judgements about 'others' risk.[46] Moreover, although linking health professionals' actions to patients' health status via action-outcome expectancies is possible (ie. a measure of response efficacy), it is noteworthy that specific beliefs about obesity such as risks to patients health were not mentioned by practice nurses' during the initial elicitation procedure in study three. Therefore, failure to make risk estimates contingent on health professionals' inaction would seem unlikely to have deflated the correlations between beliefs and behaviour.

Consistent with most applications of SCMs the present study constructed threat expectancies as largely uni-dimensional with a particular focus on health consequences; it was assumed that these would be most salient to the practice nurses as members of the medical profession. Thus, psychosocial, emotional and functional consequences of obesity were not measured. However, since threat expectancies were universally high the existence of ceiling effects may have led to deflated correlations a point made with regard to the patient literature when dealing with severe health threats (Aspinwell *et al.*, 1991). Therefore, a broader focus to threat expectancies encompassing psychosocial functioning (eg. stigma, self-esteem) may ultimately have been a better discriminator between high and low intenders.

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[46]Although it could be argued that own risk information may be used as a comparison target in making risk estimates (see research on social comparisons and unrealistic optimism eg. Perloff & Fetzer, 1986; Vanderzee, Buunk & Sanderman, 1995).

A third and more difficult issue to address is the extent to which the weaker predictive power of the SRM in comparison to the TPB may be a consequence of the 'principle of compatibility' employed in operationalising the TPB constructs. According to the principle of compatibility, to maximise predictive power, predictors and their criterions should be measured at the same level of specificity or generality and matched with respect to action, context, target and time. However, while it is difficult to see how attributions of causation could be made consequent on action, the degree of shared method variance may have influenced the predictive ability of the two models. Since, research suggests specificity is a powerful moderator of the relationship between attitudes and behaviour (Bagozzi, 1981) the superior predictive ability of the TPB over the SRM may conceivably be a consequence of the lower level of shared method variance between intentions for example and behaviour. Therefore, without empirical comparisons it is unclear to what extent predictive superiority/ inferiority is a methodological artifact or the extent to which the predictive power of the SRM could be improved via adopting Ajzen & Fishbein's compatibility principle.

Finally, the relationship between health professionals' representation of obesity and their knowledge is problematic. Beliefs about disease can legitimately be viewed as either 'expert knowledge' or 'lay belief'. However, since knowledge is an insufficient precursor of action (Ross, 1991) this raises the issue of the extent to which beliefs about disease are conceptually distinct from knowledge (Marteau & Johnston, 1990). For example, although SCMs make no assumption that beliefs should be veridical, they nevertheless assume a 'common sense' relation in terms of being 'correct psychologically' (Leventhal *et al.*, 1992). However, it is difficult to see how this differs

from misinformation particularly since in clinical settings knowledge defined as tested, verified and shared is often lacking (Marteau & Johnston, 1990; Le Fanu, 1991). Therefore, it is unclear to what extent information about disease can be considered 'belief' and therefore be expected to relate to behavioural-decisions and to what extent it can be considered 'knowledge' and be expected to be mediated by beliefs.

8.5.2. THEORETICAL EXPLANATIONS FOR FAILURE

Beliefs about disease as distal predictors of behaviour

Although, a number of operalisational and measurement problems may serve to deflate the relationship between the representation of obesity and behaviour, the predictive superiority of the TPB above illness cognitions is consistent with several lines of evidence including a temporal ordering predicted from a number of different SCMs. For example, both the ATHB (Weiner, 1985) and SCT (Bandura, 1986) predict attributions of causation will impact on behaviour via self-efficacious beliefs (ie. outcome expectancies, self-efficacy and perceptions of success). A mediational role for self-related expectancies regarding the attribution-action link has received empirical support in the area of helping behaviour (Kok *et al.*, 1992). A mediational role for illness cognitions as distal predictors of behaviour is consistent with King's (1982) original theorising in her integration of attribution theory with the HBM. Moreover, the TPB predicts attitudes are more proximal predictors of behaviour than belief-based measures such as threat expectancies (Fishbein & Ajzen, 1980). Similarly, the HAPA (Schwarzer, 1992) and SCT (Bandura, 1977) explicitly postulate that threat beliefs underlie action-outcome expectancies and precede them in temporal order. This would

also accord with Lazarus' distinction between primary appraisal mechanisms (threat expectancies) and secondary appraisal (coping expectancies) mechanisms, the former being antecedents of the latter (Lazarus & Folkman, 1984).

Furthermore, in explaining null results Leventhal *et al.* (1997) acknowledges that illness beliefs may not be 'immediately relevant' and therefore will not serve as an 'explanation' of behaviour. Indeed the degree to which beliefs are salient (Elliott, *et al.*, 1995) and hence irrelevant or so widely held they no longer effectively distinguish between those who do and do not perform a behaviour (Abraham, *et al.*, 1996), provide testaments to the difficulty in interpreting null findings. For example, commenting on the failure of doctors to consider biological causes of pathology in decision making protocol analysis, Bordage and Elstein (1982) suggest the utilization of disease-related knowledge by the experienced health professional is so 'automatic that it is no longer in conscious awareness'. The idea that decisions are made automatically is consistent with theoretical developments by Fazio (1990). Moreover, several authors have argued that beliefs such as risk perceptions may have differential effects depending on current decisional stage (eg. DiClemente & Prochaska, 1985; Weinstein, 1988) and may only be important for novel behaviours (Schwarzer, 1992). When an individual has carried out the behaviour previously, an intention or commitment to act will already be formed and perceptions of health consequences or attributions regarding obesity onset may be unnecessary in comparison to assessments of barriers and benefits (Stretcher & Rosenstock, 1997). Since obesity management is undertaken regularly, illness perceptions may (i) not be important for the maintenance of health professionals' treatment behaviour or (ii) may be unrelated to behavioural frequency. While the results

of this thesis suggest that beliefs about disease such as attributions and perceptions of risk are not important in predicting practice nurses' behaviour, this does not mean that such beliefs are unimportant in understanding the more distal determinants which may underlie belief formation and behavioural decisions.

Finally, the results of this thesis regarding the weak predictive power of illness cognitions do not appear to be confined to health professional samples. Beliefs about disease as defined by the HBM (eg. susceptibility and severity of disease) have been shown to lead to weak prediction of patient health related (Harrison *et al.*, 1992). Therefore, the finding in study one that beliefs about health consequences were largely unrelated to involvement in obesity management is consistent with the results obtained from the wider decision-making literature (van der Plight, 1998). Moreover, the finding in study two that symptom perception was moderately correlated with intentions suggests that better results can be expected if the predictive criterion is motivation rather than behaviour. The results obtained in study two with regard to the significant symptoms-intentions correlation in contrast to the non-significant symptoms-past behaviour correlation suggests threat-related illness beliefs are more proximal predictors of intentions than behaviour. The need to include a measure of intentions as an additional antecedent of behaviour of the HBM has been highlighted (Rosenstock *et al.*, 1988) and as a mediator of health beliefs on behaviour has received empirical support (eg. Bish *et al.*, 1998; Quine *et al.*, 1998). In line with recent recommendations specific beliefs about treatments might improve the prediction of the SRM as has been recently suggested (Horne, 1997; Leventhal *et al.*, 1997).

Therefore, as a consequence of the lack of theoretical elaboration regarding the specific relationships between variables, failure to find a consistent association between beliefs about obesity and behaviour may have arisen as a consequence of (i) a lack of salience (ie. the beliefs are not important for weight management decisions); (ii) hyper saliency (ie. the beliefs are so widely held they fail to discriminate) or (iii) because beliefs about obesity are distal predictors of behaviour that are differentially salient depending on decision type (eg. raising the issue, choosing an intervention) or stage in the decision process (eg. motivation, action). Therefore, the finding that perceptions of disease were largely unrelated to practice nurses' intentions and behaviours regarding obesity management joins a growing literature that suggests that either the representation of disease may not be important once a commitment to act has been taken and/or assessments of behaviour take temporal precedence over perceptions of disease.

8.6. THE INTERRELATIONSHIP BETWEEN BELIEFS

In addition to examining the relationship between behaviour and beliefs, this thesis explored the interrelationships between the various social cognition constructs. According to SCT (Bandura, 1977) and the ATHB (Weiner, 1985) beliefs about the causes of a problem and success or failure regarding its solution, are precursors to optimistic self-beliefs (eg. self-efficacy and perceived success). More specifically it has been hypothesised that attributions for the onset of a problem may be moderated by the degree to which a person is seen to be coping with the problem: coping efforts are assumed to mediate the effects of attributions for the initial cause of a health problem in predicting helping behaviour (Brickman *et al.*, 1982). However, examination of the univariate correlations across the first two studies revealed causes for the onset of

obesity were weakly and inconsistently related to responsibility for and control over, recovery. For example, in study one biological causes for the onset of obesity related to ascribing failure to patient non-compliance and current weight loss methods. In study two causes of obesity were related to attributions of failed recovery to external causes such as lack of help and support. While time-line was unrelated to causes for obesity onset in either study suggesting despite type of causation, ratings regarding the level of curability were unchanged. Nevertheless, time-line was related to optimistic self-beliefs (self-efficacy and perceived success) in both studies one and two. Hence, the more preventable and controllable obesity was perceived to be the more confident practice nurses were in raising the issue and the more expectant of future success. However, although in study one self-efficacy and perceived success were related to causes of failure this finding was not replicated in study two, possibly as a consequence of the differential measurement of beliefs about control over recovery. The emphasis in study two on items pertaining to support from others may have been construed to imply the practice nurse was to blame. Overall, the results suggest that higher self-efficacy may be related to placing responsibility on the patient for cure/control, a finding that would be consistent with a self-serving bias to preserve self-esteem (Jeffrey, French & Schmid, 1990; Fiske & Taylor, 1991). However, practice nurses' weight management differs in an important respect to studies investigating one off behaviours. Practice nurses are not making the decision a fresh. It is therefore possible that while an initial decision to extend helping behaviour is motivated by the expectancies that help will be successful, once a predisposition or intention has been made, successive attempts at help may be governed by evaluations of behaviour.

However, while it has been suggested that perceptions of threat are distal determinants of action (Bandura, 1977; Schwarzer, 1992) with situation-outcome expectancies being related to optimistic self-beliefs the specific interrelationships between attributions and threat components remain largley unspecified. Examination of the univariate correlations across the first two studies revealed perceptions of risk were largely unrelated to attributions for the onset of obesity or its control. In study one perceptions of risk were positively correlated with expected outcomes in terms of benefits to patients of weight loss but unrelated to expected outcomes in terms of perceived success and in study two were unrelated to the direct measure of attitudes. However, in study two consistent with the TPB (Fishbein & Middlestadt, 1989; Stasson & Fishbein, 1990) threat expectancies were related to subjective norms suggesting they may form part of a 'patient' component that as a distal predictor of behaviour is only partially captured by subjective norms. Moreover, reductions in threat to health did not emerge as specific advantages to raising the issue of weight loss during the elicitation procedure for behavioural beliefs in study three. This suggests that beliefs about threat may only be part of a more general belief in improvements in patients' overall well being as a consequence of weight loss and is consistent with a multidimensional conceptualisation of behavioural beliefs (Bagozzi, 1981). Future research should further explore the interrelationships between the various self-related and other-related cognitions.

8.7. THEORETICAL IMPLICATIONS FOR THE TRA/TPB

8.7.1. COMPARING THE TRA/TPB

While illness cognitions emerged as poorly predictive of behavioural decisions, self-

related beliefs about own treatment behaviour predicted both intentions and future action and supported the predictions of the TPB. For example, studies two and three compared the predictive ability of the TRA to the TPB. The results revealed that the TPB was a better predictor of practice nurses' decisions than the TRA. Adding PBC (ie. self-efficacy) increased the degree of explained variance in intentions to raise the issue of weight loss with overweight patients and behaviour. Overall, the TPB (with PBC conceptualised as self-efficacy) predicted between 38% (study two) and 72% (study three) of the variance in intentions and 60% of the variance in behaviour (study three). The degree of additional explained variance of the TPB over the TRA compares favourably with current research within the patient health-related behaviour (eg. Godin & Kok, 1996; Sheppard *et al.*, 1988; Randall & Wolff, 1996; Sutton, 1998; Conner & Armitage, 1998). This indicates that treatment beliefs were predictive of practice nurses' behaviour. Thus, these results are in accordance with previous research which has indicated that perceived behavioural control enhances the prediction of intentions over a wide range of behaviours (eg. de Vries *et al.*, 1995) and provide support for the predictive superiority of the TRA above the TPB.

5.7.2. SUBJECTIVE NORMS

The finding in study two and three that subjective norms emerged as equal to or better than attitudes in predicting intentions can be contrasted with the relatively weak predictive role subjective norms have generally played in patients' health behaviour (Godin & Kok, 1996) but concurs with other applications to the work-related arena (eg. Renfroe *et al.*, 1990; Godin *et al.*, 1992; Ngomuo *et al.*, 1995; Bunce & Birdi, 1998; Millstein, 1996). It is therefore possible that the relative importance of subjective

norms is related to the type of encounter (public *vs* private, Quine *et al.*, 1998) but as a consequence of obtaining 'public' rewards or punishments (Netemyer & Bearden, 1992). This would be consistent with research that suggests that underlying the normative component is a system of rewards and punishments (Burnkrant & Page, 1988). Blood donation while a public act is often motivated by private rewards (ie. altruism) and is poorly predicted by subjective norms (Ferguson, 1996). Such a finding is consistent with research suggesting that the influence of subjective norms on intentions is lower for behaviours in which the individual is self-involved (Nederhof, 1989). Since, helping behaviour by definition is other-orientated, health professionals' work behaviour may be governed more by social than interpersonal factors. However, since subjective norms were measured by using referents specific to the behaviour under investigation as opposed to the traditional measure which merely asks about 'most people who are important to you', more specific measures may have higher predictive power (Trafimow & Fishbein, 1994). Therefore, the results of studies two and three suggest that subjective norms are good predictors of health professionals' actions and concurs with previous research findings. Future research should be aimed at investigating the conditions under which subjective norms is superiorly predictive of intentions in comparison to attitudes and to exploring the potential processes linking subjective norms to intentions.

8.7.3. PERCEIVED CONTROL VERSUS SELF-EFFICACY

In contrast to the operalisation of PBC suggested by Ajzen (1988; 1991) as operationally defined in this thesis, perceived control and self-efficacy were conceptually and empirically distinguishable. Studies two and three revealed that control expectancies

were multidimensional encompassing perceptions of confidence in ability (self-efficacy) and task difficulty (perceived control over action). Therefore, using two different samples perceived control emerged as distinct from self-efficacy. A multidimensional representation of PBC is consistent both with previous research findings within the patient health behaviour arena (Dzewaltowski *et al.*, 1990; Terry, 1993; Terry, 1993; White *et al.*, 1994; Terry & O'Leary, 1995; Sparks *et al.*, 1997) and is supportive of Bandura's (1992, p. 124) assertions that self-efficacious and locus of control beliefs are disparate. Therefore, despite high perceived control practice nurses' still found weight management to be a difficult behaviour to perform (Triandis, 1977). Therefore, while the results of this thesis support the TPB concerning the necessity to include control expectancies besides attitudes and subjective norms as precursors to action, they are not supportive of Ajzen's (1991) unidimensional conceptualisation and operalisation of the PBC construct (ie. the combining of perceived confidence with perceived control).

In addition to being empirically distinguishable, the results of this thesis revealed self-efficacy and perceived control to (i) have differential antecedents and (ii) have differential effects on intentions and behaviour. In study three the belief-based control measures correlated with self-efficacy but were unrelated to perceived control suggesting specific barriers do not contribute to perceptions of control over performance. Moreover, in both studies two and three self-efficacy was a significant predictor of practice nurses' intentions and behaviour in contrast to perceived control. The finding that self-efficacy emerged as a powerful predictor of action control is consistent with previous research in the patient health behaviour arena and across disparate responses including habitual (eg. exercise, Dzewaltowski *et al.*, 1990);

cooperative (eg. condom use, Wulfert, *et al.*, 1996) and infrequent (cervical screening, Bish *et al.*, 1998) behaviours. The results accord with SCT which views self-efficacy as the central cognitive structure mediating between interpersonal and social variables (Bandura, 1977). Since it is unclear as to the antecedents of the PBC, additional theoretical developments and measurement are required to specify more precisely the difference between the two constructs and the conditions under which self-efficacy or perceived control are better predictors of intentions and behaviour. The results of this thesis suggest the need to focus more precisely on the measures used to operationalise control expectancies. Hence, further research is required to explore the multidimensional nature of control expectancies and to examine their belief-based antecedents.

8.7.4. IS RAISING THE ISSUE NON-VOLITIONAL?

The TRA was developed explicitly to deal with purely volitional behaviours (Ajzen, 1988, p. 127; Fishbein & Ajzen, 1975). The TPB was developed specifically for behaviours in which actual and perceived control are low (non-volitional). Therefore, it has been argued that the emergence of self-efficacy as the critical component of perceived behavioural control is problematic and undermines the theoretical basis of the theory (Terry *et al.*, 1993; Terry, 1993). Is raising the issue a volitional or non-volitional behaviour? The question then arises as to whether or not practice nurses' behaviour can be considered volitional and the TPB to be considered a better predictor of non-volitional actions. Since the TPB outperformed the TRA does this mean that practice nurses' obesity management is non-volitional? A behaviour may be said to be under volitional control if the person can at will decide to perform it (Ajzen & Madden, 1986,

p. 455). Provided action is solely dependent on the individual, intentions are assumed to be the main antecedent of behaviour. The more the execution of any given behaviour is dependent on other people or on skills or opportunities to perform it, the less the behaviour is under volitional control (Ajzen & Madden, 1986). In using such a broad definition of control in this way, most behaviour can be considered beyond the individuals complete volitional control, a point made by Ajzen (Ajzen, 1985; 1987). However, research has supported the assertion that PBC is more likely to influence behaviours considered less volitional (eg. voting *vs* weight loss, Netemeyer, Burton, Johnston, 1991). Therefore, the finding in studies two and three that the TPB outperformed the TRA would seem to indicate that practice nurses consider obesity management to be largely non-volitional. In contrast, the finding in studies two and three that practice nurses' perceived control was high and unrelated to intentions or behaviour would seem to indicate that raising the issue is largely volitional, to the extent that practice nurses' considered themselves as the cause of the intended action.

The significant path found from self-efficacy to intention found in both studies two and three implies a volitional process: in the sense that an intention is expected to form regarding an action only when the person believes they can perform the action Ajzen (1991). In contrast, the significant path found from self-efficacy to behaviour found in study three corresponds to or functions as a partial substitute for actual control over factors that could interfere with performance (Ajzen, 1987; Ajzen & Madden, 1986). According to Bagozzi, Baumgarter and Yi (1992), this direct effect of perceived control (or in this case self-efficacy) on behaviour is a non-volitional one. Therefore, based on the results of this thesis the answer to the question of whether raising the issue of weight

loss is a volitional or non-volitional process would be theoretical and dependent on what is meant be volition. Similarly, Netemeyer *et al.* (1991) found that regardless of volition TPB better than the TRA. Therefore, if non-volition means 'the effects of unforseen circumstances' then, raising the issue seems volitional. If, however, non-volition is taken to mean 'the effects of anticipated barriers' then, raising the issue can be considered non-volitional. Therefore, concluding that the TPB outperforms the TRA under conditions in which behaviour is non-volitional is problematic and suggests that the TRA is not a sufficient predictor of volitional behaviour as Ajzen and Fishbein suggest.

8.7.5. THE ROLE OF PERCEIVED CONTROL

Since the rationale for the inclusion of PBC was to function as a proxy measure of control, Ajzen (1985; 1991) suggests PBC will only directly predict behaviour in situations in which the construct is an accurate representation of an uncontrollable environment. As such it can be expected that an accurate perception of control will emerge over time ie. as a consequence of experience. Since all of the practice nurses in this theses reported being involved with weight management previously, it is likely that this routine element to their behaviour would have led to a reasonably accurate perception of control. However, the finding in studies two and three that perceived control were unrelated to either intentions or behaviour seems in direct contravention to the TPB.

First it is possible that perceived control was unrelated to either intentions or behaviour since perceptions of control are themselves a precursor of self-efficacy (Dzewaltowski

et al., 1990). For example, Bandura and Wood (1989) found that perceptions of control influenced self-efficacy in a reasoning task with those who perceived the situation as controllable maintaining a stronger sense of self-efficacy, setting increasingly higher goals and performing more effective analytical thinking. In contrast individuals who perceived the situation as uncontrollable demonstrated lower self-efficacy even when the standards set were easily within their reach. Thus, perceived control may not directly affect behaviour because it is itself an antecedent of self-efficacy encompassing evaluations of environmental responsiveness and as such may be more properly represented as a form of outcome expectancies (ie. perceived success). In studies two and three perceived control was moderately related to self-efficacy. However, since the SCMs permit intercorrelations between variables without assuming a temporal order, further research is required to elucidate the relationship between the two concepts.

Second, it is possible perceived control may have been unrelated to intentions/behaviour because practice nurses were not able accurately to assess the degree to which the behaviour was controllable. As already discussed the TPB was specifically developed for behaviours that are not under the individuals volitional control. Under situations of high volitional control the TPB reverts to the TRA. Therefore, under such an assumption the finding that perceived control were not a significant predictor of either intentions or behaviour is not surprising given that practice nurses had high ratings of perceived control. Therefore, in situations of high volition perceived control will be unrelated to decisions because intentions are sufficient precursors of action: in situations of high habit perceived control will be related to decisions because control factors will be accurately predicted. If behaviour is performed infrequently, then all possible control

factors are difficult to estimate accurately and perceived control may not reflect actual control (DuCharme & Brawley, 1995). Hence, perceived control will be unrelated to intentions or behaviour not because the behaviour is controllable but because control factors are unforeseeable. However, as discussed this explanation seems unlikely as it is generally assumed that assessments of control over repeated behaviours are likely to be more accurate as a result of experience (Ajzen, 1991). The experienced person will have more accurate perceptions of control in as much as they will have greater skill and therefore more control and will also have a better idea of possible uncontrollable factors than the novice (see discussion of past behaviour below).

8.8. AN AUGMENTED THEORY

8.8.1. ANTICIPATED REGRET AND SELF-IDENTITY

While the TPB (Ajzen, 1991) emerged as a good predictor of intentions and behaviour comparative to the results obtained in other areas of behavioural decision-making, the question arises as to whether adding additional predictors will lead to improvements in models predictive power. For example, recent theoretical developments have suggested that the theory of planned behaviour could be improved with the addition of anticipated emotional reactions, self-identity and past behaviour (Norman & Conner, 1996; Conner & Armitage, 1998). However, the results of study three suggested that although anticipated regret was unrelated to behavioural decisions, self-identity added to the prediction of intentions and is consistent with recent research (eg. Sparks & Shepherd, 1992). Nevertheless, the degree of additional variance explained by self-identity was low. Future research may be best directed towards exploring the role of health

professioals' work identity as opposed to focusing on more personalised beliefs about self.

8.8.2. PAST BEHAVIOUR

The finding in both studies two and three that past behaviour emerged as a significant predictor of intentions is in direct contradiction to the TPB that suggests past behaviour, as a variable external to the TPB, should only influence intentions via the other constructs of the model (Ajzen, 1988). Indeed Ajzen (1991) regards the test of the predictive power of past behaviour as a test of the 'sufficiency' of the model. However, despite the TPB being a reasonably good predictor of intentions and behaviour, the results of studies two and three revealed past behaviour added significantly to the prediction of intentions and accords with evidence derived from the patient literature showing that past behaviour-future behaviour correlations are higher for behaviours that have become routinised (Sutton, 1994). In a recent meta-analysis past behaviour was found to be a stronger predictor of intentions in domains that supported habit formation such as those undertaken frequently and under stable contexts (Ouellette & Wood, 1998). However, while a constructs predictive power permits its identification as a determinant of action, it reveals nothing about the processes by which a construct is translated into action. In the absence of a theory of how past behaviour influences future performance, past behaviour is potentially a nuisance variable since it provides no information on potential ways to intervene. Therefore, Ouellette and Wood's (1998) thesis which provides an integration of 'habit' into contemporary social cognition research by suggesting that the impact of past behaviour derives from the cognitive processes associated with well-practised behaviours in stable contexts is theoretically

important. Under conditions of high frequency simplified decision rules are used and less information in employed in making a decision (Verplanken, Aaarts & van Knippenberg, 1997). Hence, Ouellette and Wood (1998) suggest that effective change strategies may include the formation of explicit plans to initiate and implement new behaviours thereby linking with the work of Gollwitzer (1996) and Bagozzi (1992) on implementation intentions and goal commitment (see below). Intervention based on promoting 'wanted' habits via positive reinforcement (Verplanken *et al.*, 1998). Therefore, further exploration of the relationship between past behaviour and perceived control has the potential to add to current theoretical debate surrounding the status of past behaviour as an explanatory construct. Therefore, when behaviour is repeated and becomes habitual it may no longer be considered a reasoned action. However, as this thesis suggests behaviours do not necessarily become automatic as a consequence of frequent performance (Sutton, 1994; Maddux, 1997). In the present thesis high levels of previous behavioural performance were consistently found to be related to intentions but did not directly influence behaviour possibly because behaviour was not completely under practice nurses' volitional control.

8.8.3. PERCEIVED CONTROL AS A MODERATOR OF PAST BEHAVIOUR

The finding in study two of an interaction between perceived control and past behaviour revealed that habit was only related to intentions for those who also had a strong belief in control over raising the issue. Moreover, in study three the significant interaction between perceived control and past behaviour on future behaviour suggests habit was only related to behaviour for those who had also performed the behaviour frequently in the past and held a strong belief in control over raising the issue. However, in study

three no interaction was observed between perceived control and past behaviour. Why were the two sets of results inconsistent? Ratings of perceived control were high in both studies showing that practice nurses considered they had control over the decision to raise the issue. However, the correlation between perceived control and intentions was much higher in study two than in study three. Examination of the means from the two studies suggests that practice nurses in study three perceived themselves to have more control over raising the issue than those in study two. Moreover, the correlation between past behaviour and intentions was higher in study three in comparison to study two and practice nurses in study three had a higher mean. It may be, that once a certain level of perceived control has been reached it is no longer related to motivation to perform the behaviour. However, the interaction between perceived control and past behaviour on future behaviour may reflect the accuracy with which perceived control can be estimated. This result accords with a number of studies that have suggested that intentions are only related to behaviour when past behaviour (habit) is weak: as habit increases the predictive power of intentions decreases (eg. Beale & Manstead, 1991; Verplanken *et al.*, 1997; Bunce & Birdi, 1998; Verplanken, Aarts, van Knippenberg & Moonen, 1998). Such a finding is supportive of Triandis (1977) who argues that intentions will only predict behaviour when attitudes are weak and is compatible with Fazio's (1980) automatic processing as a function of saliency. Overall the results suggest that past behaviour may set boundary conditions for the applicability of the TPB and therefore warrants further investigation for the moderating effect on intentions and PBC and should not be dismissed as a nuisance variable.

8.9. DEGREE OF SHARED REPRESENTATION OF THE CONSULTATION

8.9.1. CONCORDANCE BETWEEN PRACTICE NURSE AND PATIENT

Finally, in addition to examining practice nurses own cognitions this thesis attempted to investigate the health professionals' beliefs in the context of a patient consultation (see chapter seven). The results of study four revealed that in only half of the consultations was the treatment plan agreed as being acceptable (easy to follow and based on patients interests in weight loss method chosen) or weight loss considered a likely outcome. Since perceived success is a prerequisite for goal achievement, the finding that neither practice nurse nor patient considered weight loss a likely outcome may provide a means with which to intervene. Indeed the more positive practice nurses were about the consultation the greater the degree of concordance regarding information gathered and expectations for patient adherence. However, the more positive patients were about the consultation, the more optimistic they were (relative to practice nurses) regarding acceptability of the treatment plan, outcome expectancies and the number of interventions offered. In addition, the more optimistic practice nurses were (relative to patients) regarding adherence to advice, the more likely patients were to lose weight. This suggests that merely increasing expectations for success (for either patient or practice nurse) may be counterproductive if it increases discordance between the dyad. Presumably, a certain degree of unrealistic optimism by both provider and patients will be adaptive and future research should investigate the role of asymmetrical optimistic beliefs in the communication process. Interventions designed to increase optimism for either party may be counter productive by producing asymmetry between patient-provider.

8.9.2. POTENTIAL IMPACT OF BELIEFS ON PATIENTS

Therefore, although, the role of positive self beliefs in own behavioural regulation has been well documented (Bandura, 1977) and emerged as predictive of health professionals' own behavioural decisions (see studies one to three), the importance of health professionals' optimism regarding treatment outcomes may extend to patients behaviour. The therapeutic influence of clinical expectations (eg. Gracely, Dubner, Deeter & Wolskee, 1985; Desharnais, Jobin, Cote, Levesque *et al*, 1993) has been documented. Moreover, research suggests health professionals' communicate their beliefs to patients via the framing of information (Marteau, 1989*a*) and that patients' perceptions of health professionals influences patient care (Bower, West, Tylee & Hann, 1999). Similarly, negative beliefs may be communicated to patients creating a self-fulling prophecy. For example, in a study of the barriers to the uptake of treatment by alcoholic women Vannicelli (1984) suggests that the low expectations held by treatment personnel about women's prognosis and the effective ingredients of treatment are a serious barriers to women entering treatment, staying in treatment and attaining successful outcome. Thus, demonstrating how the attitudes of professionals to service users and their health problems may be a powerful influence in patient recovery (Friedman, 1993). Hence, the effects of negative expectations regarding treatment outcomes may extend beyond own action control and be communicated to patients directly. In essence what patients may hear is 'try and lose weight but it won't work'.

Therefore, although practice nurses' cognitions were related to their behavioural decisions, the results of study four suggests the existence of substantial discordance between practice nurse and patient dyads regarding both the process of care and the

likely outcomes of the weight management consultation. Therefore, the relationship between reported behaviour by self and by patient is problematic and difficult to untangle. Whilst it could be argued that direct observation would provide 'validation' of these accounts, the observer is yet another perspective. Interpretational problems may imply differences are more semantic than substantive but semantic differences are themselves an indication of substantive difference. For example, research suggests eating behaviour and the meanings of different foods have changed considerably over the last decade (Le Fanu, 1991; Lupton, 1996). Hence, generational and social class differences have been found for the interpretation of terminology such as the word 'healthy eating' (Lupton, 1996).

Since social psychological biases exist in the processing of social information with optimistic biases performing a positive functional role (Taylor & Fiske, 1991), the results of discordance suggest that the biases in social reasoning may be fruitful. It may not be useful to try to decide on who is 'correct' but instead maybe it might be more profitable to try and discover what combination of beliefs leads to the best outcomes. It is likely that recursive causality exists between patient and health professional perspectives which need to be incorporated into current models. As the patient makes an attempt to cope with obesity (or rejects an offer of help), the health professional may adjust their beliefs accordingly. Effective communication may rely on communicating positive aspects between the two parties ie. practice nurse indicating to patient that they are realistically optimistic about the patient's outcomes and patients' indicating to practice nurse that they are making genuine efforts to cope.

8.10. PRACTICAL IMPLICATIONS

8.10.1. SERVICE PROVISION

From an applied perspective, the results of this thesis suggest the content of practice nurses' obesity management accords with current recommendations for weight reduction in general practice (Field & Henderson, 1990). The majority of practice nurses reported offering weight loss interventions that involved changes to current dietary content, with an emphasis on healthy eating and exercise as opposed to a more traditional calorie controlled diet (see study one). As such the results extend and corroborate earlier research findings derived from both GP (eg. Cade & O'Connell, 1991) and practice nurse samples using alternative methodologies (eg. Ochera *et al.*, 1993). However, the level of involvement in obesity management reported in this thesis was low in substantive terms: less than two thirds of practice nurses reported giving weight loss advice more than once a week despite evidence that suggests a high window of opportunity (eg. Silagy, Muir, Coulter *et al.*, 1993). Moreover, counselling rates for health promotion may be even lower than reports suggest as evidence indicates that health professionals may overestimate their rates of providing preventive services (Montaño & Phillips, 1995).

Furthermore, as found in study one, even when the issue of weight loss had been raised less than half of the practice nurses reported spending more than ten minutes discussing weight loss and dietary change. This shows that practice nurses could be encouraged both to offer advice more frequently and to spend more time with each patient when giving advice. The issue of low involvement in obesity counselling parallels previous

research findings using GP samples. For example, research suggests that even when GPs raise lifestyle issues subsequent discussions are often shallow and lacking adequate follow-up (Sätterlund Larsson, Säliö & Aronsson, 1987). Since the potential for significant improvement in patients health status through early recognition and intervention exists, the barriers to practice nurses identification and involvement in the clinical management of obesity require further explication. Given the current impetus for the prevention of obesity and further weight gain why are practice nurses not more involved in weight management? Low levels of involvement in weight management may arise as a consequence of practice nurses (i) believing weight management will be ineffective in bringing about change; (ii) disagreeing with a preventive model of health promotion, or (iii) perceiving patients as in opposition to receiving weight control advice.

8.10.2. EFFICACY OF WIDE SPREAD PREVENTION

While the evidence is inconclusive regarding the efficacy and cost effectiveness of population-based advice (Gillam, 1992), research is supportive of opportunistic rather than clinic-based approaches (Wilson, McDonald, Hayes, & Cooney, 1992). Repeated exposure to advice and brief interventions are effective in producing small behavioural changes of between 5-10% (eg. Austoker, Sanders & Fowler, 1994). Since, positive health behaviours tend to cluster together (Kirscht, 1983) raising the issue of weight loss may be a means to bring about dietary or exercise change and vice versa. Nevertheless although it has been reported that GPs consider routine repetition of health promotion to be frustrating and ineffective (Bruce & Burnett, 1991) it is unclear if they are opposed to the initial raising of such issues. In the present thesis practice nurses were generally

neutral concerning raising the issue with all overweight patients (see studies two and three). The results of previous research suggest health professionals in primary care have been resistant to a population-based preventive model of health promotion (see chapter two). This suggests that health professionals in primary care do not necessarily agree with a population based preventive approach.

8.10.3. A MISMATCH BETWEEN IDEOLOGY AND CLINICAL PRACTICE?

Does a mismatch between current ideology and clinical practice provide a possible explanation for the low rates of intervention reported by practice nurses? Within the patient literature it is generally assumed behaviours are unambiguously either correct or incorrect (eg. intending to stop smoking). However, it is recognised that some health behaviours depend on context for the definition of appropriateness (eg. condom usage depends on whether or not participants are using other forms of contraception or having penetrative sex). Similarly, much of the assessment of 'correct' medical practice is context dependant. Therefore, in considering preventive health care a distinction must be made between frequency of lifestyle advice and appropriateness and quality of such advice. It may not be either practical or desirable for all patients to receive intervention. Research suggests advice is more likely to be acceptable to patients if it is directly related to a presenting problem (Stott & Pill, 1990). Achieving levels of 100% are likely to be counterproductive and may produce worried-well (Stoate, 1989) and resistance to change (Butler, Pill & Stott, 1998; Chaiken & Eagly, 1993).

Nurses curriculum has altered from a disease centred approach concerned with treatment to a health promotion approach based on offering information (UKCC, 1986).

Research suggests that the majority of doctors and nurses consider ill health as the prime motivator for changing eating patterns with less than a third viewing weight as a motivator for changing eating habits (Buttriss, 1997). This fits with a medical model of treatment rather than prevention. Similarly, it has been found that two thirds of GPs disagree with the statement that discussing smoking with all presenting smokers was an appropriate use of time, believe lifestyle advice should be linked to the patients presenting problems and report mainly offering advice in the presence of symptoms (Coleman & Wilson, 1996). Doctors are also more likely to schedule patients for a return visit (despite assessed level of patient motivation) when they present with a traditional biomedical problem in comparison to disease prevention problems (eg. obesity) which are more likely to be relegated to self-care (McArtor *et al.*, 1992). Such a strategy may have advantages in terms of increased likelihood of success: research suggests health promotion interventions may be more promising in 'high risk groups' or groups with a preexisting health problem who may already be contemplators of change (eg. Cupples & McKnight, 1994, Meland, Lærum & Ulvik, 1996). However, although the efficacy of weight loss interventions aimed at contemplators remains unexplored. Disagreements with recommendations and guidelines are one factor related to professional noncompliance (Ley, 1981). Since it cannot be assumed that practice nurses share the views of GPs, the circumstances under which practice nurses consider it appropriate to offer weight loss advice may provide insights into their preferred model of working (ie. cure *vs* prevention).

8.10.4. PRIORITISING PATIENTS

Despite the prevention of obesity (and hence weight-related morbidity) having received

a high profile at a governmental level (particularly in the light of high rates of recidivism), the results of this thesis show practice nurses are prioritising patients based on degree of obesity and preexisting morbidity. For example, in study one less than two thirds of practice nurses said they would offer weight loss advice to a healthy overweight (BMI >24.9) patient prior to the presentation of pathology, with more than a third of practice nurses waiting until the patient was obese (BMI > 29.9) to intervene. More than a third of practice nurses said they would reserve intervention for patients with weight-related morbidity. However, once patients were already ill most practice nurses would offer weight loss advice to an overweight patient. Nevertheless, approximately 10 percent of practice nurses were embracing a totally curative model by only offering advice to an unhealthy obese patient. Although, these results are based on practice nurse self-report, nearly three quarters of the patients recruited in the final study were already severely obese (BMI > 29.9) suggesting that the prevention of obesity outside the context of a weight-related morbidity may be given a low priority by a significant proportion of practice nurses. Even at such high levels of obesity less than 20% of consultations were weight loss practice nurse initiated compared with 40% patient initiated (see study four). Obesity management being deemed appropriate for only some patient groups (eg. BMI>29.9 or those with a pre-existing health problem). Such an approach is firmly located within a medicalised paradigm rather than a preventive ethos and is essentially reactive to disease symptomology as opposed to proactive in promoting health.

8.10.5. PSYCHOLOGICAL OUTCOMES

In rationing advice it is important for health professionals to remember that provider

recommendations may function as successful cues to action as suggested by the HBM (Janz & Becker, 1984). Behavioural and biological indicators (eg. dietary change and weight loss) are not the only valid measure of successful intervention. As argued by Oldenberg (1994) health professionals' often have contact with patients when they are most amenable to change and may be able to move patients from precontemplation to contemplation or contemplation to action. For example, research suggests patients expectations of GPs approval is significantly associated with uptake of health services providing an indication of the importance of social approval from health professionals (eg. Brown, *et al.*, 1996; Orbell *et al.*, 1996). Cognitive movement through the change process may also be a valid therapeutic outcome particularly in light of current stage-based models of change (DiClemente & Prochaska, 1985) and the influence of planning on self-regulation (Gollwitzer, 1993). Therefore, similar provider interventions may produce different responses from patients depending on whether patients are aware of their risks or how to reduce them (Weinstein, 1988). For example, smoking patients may not want advice because most are aware of risks to health from smoking and understand that stopping smoking will reduce their risk (Butler *et al.*, 1998). In contrast although most obese patients are aware that their weight poses a risk to their health (Little, 1998) they may not know how to reduce both their risk and their weight by making simple changes to their diet particularly in the light of evidence suggesting that patients' knowledge of diet is poor (Buttriss, 1997).

8.10.6. PERCEPTION OF PATIENTS DESIRES

If health professionals hold views about the type of patient most likely to respond to treatment this might function as a cue to their own action. A recent study by Love *et al.*

(1995) reveals that health professionals hold complex views about patients' behavioural change with motivation afforded a central role in the change process. Moreover, research suggests that doctors are more likely to anticipate compliance when patients have clinically significant problems (Greenberg *et al.*, 1984). The results of study one indicate that practice nurses were happy to wait for patients to raise the issue. Perceptions of regret for not raising the issue were neutral and perceptions of normative pressure from patients were lower than those for the other referent groups (see study three) suggesting that practice nurses may hold low expectations of patients desires for advice. However, research suggests that the patients of doctors who offer preventive services are more satisfied with their medical care than patients who are not offered these services (Weingarten, Stone, Green *et al.*, 1995). Patients' preferences may not be what even experienced health professionals assume them to be: research suggests that health professionals often do not accurately assess either patients' health status or their treatment preferences (Wilson, Green, Goldman *et al.*, 1997). Information may be judged as relevant by the provider but not by the patient particularly lifestlye discussions which may be viewed as an of infringement of privacy by either party (Larsson, Salio & Aronsson, 1987). The potential for disparity highlights the importance of exploring both health professional and patient perspectives in examinations of provider variability and patient outcomes.

8.11. METHODOLOGICAL CAVEATS

8.11.1. Response rates

The results of this thesis should be accepted with a number of methodological caveats

in mind. First, the response rates ranged from 25% to 65% which may influence the generalisability of the research findings particularly for study four. Nevertheless, the rates obtained concord well with the average rates reported for health professional samples (17% to 40%, MacPherson & Bissett, 1995) and recent published research (11% by Levine *et al.*, 1993; 56% by Kee *et al.*, 1995; 33% by Bunce & Birdi, 1998) suggesting non-responses were not specific to obesity management or practice nurses. The particularly low response rate obtained in the final study in this thesis was exacerbated by patient recruitment problems and attrition rates. Problems with recruitment of patients into research studies via 'gate keepers' (eg. GPs and practice nurses) have been reported elsewhere (Peto, Coulter, Bond & 1993; Wiles, 1994). High attrition rates have been reported from weight loss programs both during treatment (0-26%) and at follow-up (12.4 -54%) (Wilson & Brownell, 1980). However, the practice nurses participating in the studies contained herein were recruited from a wide geographical area of England and although few studies have used practice nurse samples, the profile characteristics obtained accord well with those reported elsewhere (eg. Ross *et al.*, 1994). Examination of responders and non-responders where possible revealed few significant differences between the two groups. Therefore, the response rates obtained in this thesis are comparable with published research given the target population (health professionals) and the study design (postal survey). Nevertheless it is possible that responders may be more likely to hold strong opinions regarding obesity management and/or to be more involved in weight management. While the samples obtained in this thesis cannot purport to be representative of all practice nurses they would appear to be reasonably representative of responding practice nurses as a whole.

8.11.2. *Response bias and consistency effects*

Second, the use of questionnaire based responses are inherently problematic. Although, the aim of questionnaires is to gain access to non-verifiable constructs such as thoughts and beliefs, remembering may be thought of as narrative reconstruction which contains elements of creative elaboration and selective emphasis. For example, early social psychological research suggests that individuals suffer from a 'false consensus effect' in which they perceive the behavioural choices and judgements they have made as relatively more common than do individuals who have not made these choices (Ross, Greene & House, 1977). Moreover, ego defensiveness biases may lead individuals to believe their behaviour approximates an actuarial norm to make their choices seem valid (Ross *et al*, 1977). Therefore, two types of response biases may occur with the use of self-report: respondents may be motivated to exaggerate both the desirability of their beliefs and behaviours and the consistency between the two measures. Neither issue has received much empirical investigation (Sheeran & Abraham, 1996). However, both negative (Wulfert *et al.*, 1996) and positive results for social desirability and consistency effects (Sheeran & Orbell, 1995; Ouellette & Wood, 1998) have been reported making predictions regarding the types of behaviours and direction of response biases problematic.

Bias towards social desirability is likely to be more prominent with behaviours which have a clear social desirability/undesirability element (Kirsct, 1983). Unlike health preventive behaviour with a finite socially approved response (eg. the use of condoms to prevent HIV), weight management does not easily lend itself to one 'correct' answer. Whilst the use of social desirability scales may help to assess the likelihood that any

given individual is likely to give more socially desirable answers it will not provide information about 'forced' consistency. Therefore, with regard to the issue of consistency, such a charge is more problematic. Presumably subjects answer consistently because items are interpreted as measuring similar constructs; consistency in this context is equated with reliability. The problem arises when the consistency between one construct in a correlational pair is artificially inflated (ie. behaviour and intentions or intentions and attitudes). Hence, the issue of consistency is a problem which lies at the heart of the question of the temporal ordering or direction of causation in the attitude- intentions and attitudes-behaviour relationships. For example, ordering effects have been found with regard to past behaviour and intentions so that consistency differs depending on the sequence in which participants answer questions (Ouellette & Wood, 1998). If individuals are inclined to maintain behavioural and attitudinal constituency, it has been suggested that self-reports may over-estimate the behaviour-intention relationship (Hessing, Elffers & Weigel, 1988). However, this would suggest that over time studies using self-report would have stronger intention-behaviour correlations than those using objective measures. Using meta-analysis Randall and Wolff (1994) explored the relationship between time interval and the intention-behaviour correlation. Results revealed that the average intentions-behaviour correlation remained strong (r=.45) and its predictive ability was only marginally significantly influenced by the use of self-report measures suggesting consistency between intentions and behaviour is not a methodological artifact.

8.11.3. Direction of causality

Finally, confidence in directionality of observed relationships is limited by the

simultaneous measurement of variables used in this thesis. Therefore, as a consequence of reliance on correlational data caution must be shown in the interpretation of the results. Correlational studies cannot provide evidence of causality. Experimental studies are required in order to show that a change in one variable is the cause of the change in another variable. As argued by Bem (1972) people may infer their attitudes from their behaviour. In principle it is possible to reverse the direction of causality in SCMs. For example, practice nurses who raise the issue frequently have higher self-efficacy and more positive outcome expectations as a consequence of prior experience. This assertion is theoretically justifiable given that SCT is based on a model of reciprocal determinism which posits that behaviour, cognitive and environmental factors interact as a set of 'triadic determinants' of each other (Bandura, 1977): cognitions are both behavioural antecedents and consequences. Indeed several models either explicitly or implicitly employ recursive causality (eg. SRT and SCT). However, the continuous flow between behaviour, cognition and environment is difficult to capture in statistical models. At which point does an antecedent of behaviour become a determinant? Hence the intuitive appeal of stage models which divide participants into a series of discrete stages. Therefore, future research is required which attempts to investigate behaviour and beliefs over time and which attempts to change both cognitions and behaviour.

8.11.4. Appropriateness

Finally, in focusing largely on frequency of intervention choice and frequency of raising the issue, it is recognised that obesity management comprises of a complex series of behaviours loosely related by the generic pursuit of weight loss as a goal. Weight loss advice depends on (i) patients presenting in a certain context (opportunistic, health

check etc.); with (ii) certain criteria (BMI level, health problem, motivation); (iii) on patients being receptive to advice (motivation); and (iv) the communication that occurs between the two parties. In an attempt to access broad generalised beliefs towards obesity and its management, the role of contextual factors was not examined. Clearly however, when practice nurses' encounter patients within a clinical setting a range of contextual factors will impact on defining the problem space.

8.12. CONCLUSIONS AND SUGGESTIONS FOR FUTURE DIRECTIONS

8.12.1. THEORETICAL CONCLUSIONS

Overall, the results of this thesis suggest that involvement in obesity management can be best predicted from self-related beliefs about behaviour: behavioural expectancies exhibited the greatest predictive power in comparison to other-related beliefs about disease. In particular self-efficacy and intentions emerged as robust predictors of action, a finding consistent with both social cognition theory and the theory of planned behaviour. In contrast to self-related beliefs, other-related cognitions about illness emerged as relatively unimportant as proximal predictors of obesity management decisions. However, in contravention of the theory of planned behaviour, past behaviour emerged as an independent predictor of intentions and as a moderator of both intentions and perceived control. Since, to understand the decision-making process requires an understanding of the factors that underlie proximal behavioural determinants (ie. self-related treatment beliefs), there is a necessity to specify under what conditions the relative importance of different distal predictors will occur. Disease-related beliefs about threat while unrelated to obesity management may be more important in acute-

based health care where patients' health benefits are more immediately related to action. Similarly, causal beliefs (ie. beliefs about illness onset and control over recovery) may be more important in earlier decisional stages (ie. when choosing initial treatment type) than frequency of intervention. Furthermore, it is likely that various cognitions may interact with each other in order to predict self-regulation. However, based on current theoretical developments it is unclear when and how this interaction may occur. Therefore, the main contribution of this thesis concerns the synthesis of two different approaches to behavioural prediction: the theory of planned behaviour and self-regulation theory. However, in doing so a number of issues have been raised, particularly with reference to the interrelationship between the various beliefs and their relationship with behaviour.

The SCMs employed in this thesis can be categorised in terms of the extent to which each theoretical model describes the processes underlying decision-making as opposed to focusing on describing decision outcomes. For example, the TPB and the HBM are not intended as representations of the process of decision-making but only as a convenient means with which to capture the output of a process. They postulate a series of nonspecific relationships between the constructs and make no attempt to specify the psychological processes underlying the constructs. Little is said about how the constructs are related, whether manipulation of one construct would change another one and if so in what way. Therefore, computational level description ensures theoretical longevity. Since, the theories use general propositions this makes them difficult to refute. The mathematical expression of these SCMs can therefore only attain the status of a computational or descriptive representation of the output of decision-making

(Fishbein, 1993; Kashima & Gallois, 1993; Bagozzi, 1992). However, several SCMs reviewed in this thesis attempt to describe the processes involved in belief formation. For example, SCT attempts to describe processes underlying the formation of optimistic self-beliefs. Weiner's ATHB attempts to describe the processes involved in the formation of attributions of causation for past events and to relate these to optimistic future expectancies. Leventhal's SRT attempts to describe the processes in which the representation of an illness guides interpretation of future events. As such there is good reason to attempt an integration of the psychological processes underlying different decision-making models. Therefore, future research should be directed towards attempting to develop and test more specific hypotheses regarding the relationships among various cognitions

While SCT and SRT explicitly incorporate feedback appraisals and coping plans (dynamic recursive causation), their description and application have almost exclusively been static. In part this has arisen out of pragmatic confines of research process. As noted by Liska (1984) a tension exits between the identification of contingency conditions and the maintenance of a parsimonious model. Specifying numerous contingency effects via interactions leads to potential multicollinearity. However, treating contingency conditions as nuisance variables as Ajzen and Fishbein do regarding past behaviour undermines their conceptual significance. Since numerous lines of research suggests that the frequency of past behaviour influences not only future behaviour but also moderates the effects of other variables, the challenge for future research is to identify the contingency conditions by which variables such as past behaviour moderate the effects of the other variables contained within an integrated

model.

Finally, all the theories reviewed represent investigations into the motivational phase of decision making. However, several investigators have begun to explicate the factors involved in moving from an intention (a decision) to action (eg. Orbell & Sheeran, 1998). For example, Bagozzi (1992) proposes a number of means-end analytic processes that occur between the initial decision and actual goal achievement including planning and assessment of instrumental acts leading to goal commitment. Similarly, Gollwitzer (1993) explores the factors involved in the planning process and advances the thesis that implementation intentions provide a means by which the intention behaviour gap can be reduced. Implementation intentions are defined as intentions that link an intended goal-directed behaviour to an anticipatory situational context. The mechanisms by which this occurs is through the creation of a heightened accessibility of the mental representation of the specified situational cues that induces direct (automatic) control of the intended behaviour through such cues. Gollwitzer (1993) distinguishes three phases to goal pursuit: pre-decisional, post-decisional (pre-action), actional and evaluative (post-actional phase) which compares what was achieved with what was desired and is similar to the processes espoused by Bandura (1977) and the feedback loops in self-regulatory theory. Moreover, the health adoption process approach (Schwartzer, 1992) is an attempt to integrate SCT with an explicit planning process and is consonant with the idea of decision making as a process in which decision-makers can be located (eg. stage-based models). Therefore, future research should be aimed at incorporating health professionals' decisions within multistage models.

8.12.2. THEORETICAL RECOMMENDATIONS

Based on the results of this thesis self-related beliefs about behaviour emerged as more proximal predictors of action than other-related beliefs about disease. However, the following theoretical implications are raised for future research: (i) given the potential overlap between models the necessity to conceptualise and test construct distinctiveness within an integrated model; (ii) in light of the importance of distal determinants of behaviour the need to examine and hypothesise specific interrelationships between beliefs rather than focus on testing direct effects on behaviour; (iii) the need to explore further the psychological processes involved in decision-making; and (iv) the need to relate beliefs to the decisional stage and behavioural type (eg. frequency); and (v) the patient context. Therefore, the necessity to incorporate the ongoing responses of both patient and provider during a consultation focuses attention on the development and testing of more dynamic multistage and recursive decision models.

8.12.3. PRACTICAL CONCLUSIONS

Most accounts of health professionals obesity management are largely descriptive with no theoretical framework to guide interpretation and no clear theoretical rationale for inclusion or exclusion of different beliefs. Post hoc rationalisations give limited insight. Therefore, this thesis extends the examination of social cognition models beyond student and patient populations to a unique population of health professionals, that of practice nurses. First, with regard to the content of practice nurses obesity management, intervention choices were in accordance with current recommendations although the extent to which advice is appropriate remains to be determined. Second, with regard to frequency of advice, the results of this thesis are disappointing. Practice nurses report

moderate to low intervention rates suggesting involvement in obesity management could be substantively improved. The results of this thesis suggest that positive outcome expectancies and a positive impression of a motivated patient were more important correlates of behaviour and intentions than negative beliefs and external barriers (eg. time constraints). Thus, interventions should be directed at those with low expectancies of positive rewards from behavioural performance and the perception of an interested motivated patient increased in contrast to eliminating the anticipation of negative outcomes. In part it would appear that a failure to embrace a preventive policy may result from practice nurses' low expectations of success and perceptions of patients not wanting advice. This hypothesis needs to be tested further as it has important implications for the future direction of practice nurses' efforts to promote weight loss. However, it is unclear from the results of this thesis whether low intervention rates may also reflect perceptions of small windows of opportunity (ie. patients presenting in consultations, for which obesity management would not be considered suitable); as a consequence of a disagreement with the fundamental principles of the primary prevention of obesity or a belief that advice will be ineffectual. Further, although raising the issue can be expected to relate to patient outcomes to the extent that if the issue is not raised patients may not contemplate losing weight, it does nothing to explain variability in patient outcomes once the issue has been highlighted. For example, a practice nurse may have a high level of raising the issue while lacking commitment to helping patients lose weight. Further, in focusing on the cognitive antecedents of behavioural decisions, this thesis can say nothing about the appropriateness of practice nurses reported interventions. Clearly, appropriateness of intervention is dependant both on current gold standards and patents own needs and preferences. However, at

present there are no clear guidelines for obesity management indicating the most appropriate treatment approach to weight management. Future research should explore the circumstances/context under which raising the issue is considered an appropriate strategy by both patients and practitioners and the role of expert and lay knowledge in constructing expectations regarding the 'private' and 'medical'. In particular exploring the contextual factors for patients that would make advice acceptable with a view to increasing practice nurses expectancies for patients would seem fruitful.

8.12.4. PRACTICAL RECOMMENDATIONS

Based on the results of this thesis the following cognitions could be targeted in an intervention as a means to improve practice nurses advisory rates: (i) increasing practice nurses' expectations of success via raising expectations regarding patients desires or by attempting to change the way outcomes are measured from a medical outcome (ie. weight loss) to either a psychological (eg. patient satisfaction) or behavioural outcomes (eg. small changes in eating habits); (ii) improving perceptions of social support via changes at an organizational level to promote positive aspects of weight management particularly from GPs; and (iii) increasing practice nurses own perceptions of self-efficacy at performing weight management behaviours.

8.13. SUMMARY OF THESIS

This thesis has examined the cognitive predictors of practice nurses' management of obesity using a combination of SCMs and placed providers' beliefs within the context of the patient. An integrated framework derived from the theories of self-regulation (SRT) and planned behaviour (TPB) was used to explore the role of self-related beliefs

about behaviour and other-related beliefs about disease. On the basis of the research findings the following main conclusions can be drawn. First, the representation of behaviour was more important in predicting practice nurses' treatment decisions than the representation of obesity. Specifically, self-related beliefs about treatment as defined by the theory of planned behaviour emerged as better predictors of practice than other-related beliefs about obesity as defined by self-regulatory theory. Therefore, SCMs that prioritise behavioural expectancies as the most proximal predictors of action control (eg. TRA/TPB, SCT, ATHB), provide a better conceptual framework for understanding health professionals' treatment decisions than those that emphasise illness cognitions (eg. HBM, SRT). Therefore, if the goal of research is to 'predict' providers' care provision, it may not be necessary to integrate the representation of behaviour (ie. TPB) with the representation of disease (ie. SRT). Second, an integrated model focuses attention on the interrelationships between the various social cognitions. This raises the issue that for providers of care, disease-related cognitions are about the health status of others' (not self) and it may therefore be unsurprising if they emerge as distal correlates of health promotion counselling. However, while disease-related cognitions may not be needed if trying to predict the frequency or intensity of routine provider behaviour, they may nevertheless be important in the selection of initial behavioural goals particularly in the context of acute illness. Third, while the theory of planned behaviour emerged as a better predictor of health professionals' treatment decisions than the theory of self-regulation, improved prediction was obtained by using a multidimensional representation of perceived behavioural control and adding a measure of habit.

Fourth, since provider actions are explicitly directed towards patient care, the discordance found between practice nurse and patient representations of the consultation process suggest, intervening to change health professionals' treatment decisions may not be sufficient to change patient outcomes. The necessity to take into account the different perspectives held by patient and provider, means that decisions must be made regarding the target of intervention (ie. provider behaviour or patient outcomes). Since the degree of discordance was related to both patient and provider outcomes, if the goal of intervention is to improve patient expectations of success, it may also be necessary to improve health professionals' expectations of success if increasing patient-provider discordance is to be avoided. Therefore, in exploring health professionals' clinical practices, research should take into account not only the representation of behaviour and the representation of disease, but should also place these beliefs in the context of patient-provider representations of the consultation process.

Finally, this thesis has focused on the motivational stage of decision-making. In doing so the factors proceeding motivation and those involved in translating motivation into action were not examined. However, future research is required to explore the processes involved in belief-formation and the mechanisms by which cognitions are translated into action (ie. planning). If an understanding of health professionals' behaviour and patient-provider communication is to be achieved, decision-making models will need to develop ways in which the interaction between patient and provider can be accommodated. Such an endeavour requires the incorporation of a more dynamic perspective into current psychological models. Future research therefore

should be directed towards exploring the role of social cognitions in consultation outcomes using the recursive elements implicit in existing social cognition models and more recent stage-based theories.

APPENDIX A

The following section of the questionnaire is designed to find out more about your current practices with regards to weight loss and dietary change.

How often do you give weight loss/dietary change advice? (Please tick)

Less than once a week ❑ At least once a week ❑ More than once a week ❑

How long do you usually spend counselling a patient about weight loss/dietary change?

Less than 5 mins ❑ 5-10mins ❑ 11-20mins ❑ More than 20mins ❑

As a health care professional, how confident do you feel in counselling patients about weight loss/dietary change? (Please circle the answer which best applies to you)

Not at all Confident	1	2	3	4	5	6	7 Extremely Confident

If you offered weight loss/dietary change advice to a patient, how confident are you that they would follow through with your advice?

Not at all Confident	1	2	3	4	5	6	7 Extremely Confident

If you offered weight loss advice to a patient, how confident are you that they would lose weight?

Not at all Confident	1	2	3	4	5	6	7 Extremely Confident

Overall, in the last 6 months how successful do you feel you have been in bringing about weight loss/dietary change?

Not at all Successful	1	2	3	4	5	6	7 Extremely Successful

Before you actually weigh a patient, which of the following statements reflects the circumstances under which you usually decide whether weight may be an issue? (Please tick the answer which occurs most OFTEN)

I only consider weight loss, if the patient mentions weight loss ❑
I only consider weight loss, if the patient looks overweight ❑
I only consider weight loss, if the patient has a weight related health problem ❑
I only consider weight loss, if the patient has been referred by the GP ❑

Having decided that weight is an issue, which of the following methods do you usually use in order to determine how overweight the patient is? (Please tick)

Height weight Chart (eg. Metropolitan Life Insurance Weight Tables) ❑
Body Mass Index (BMI) ❑ Waist to Hip Ratio ❑

In an otherwise healthy female patient, height 170 cm (5'7"), at what weight would you consider recommending weight loss advice? (Please tick one box only)

	68-72kg ❑	73-86kg ❑	87-95kg ❑	96-115kg ❑	116-134kg ❑	134+kg ❑
BMI	[24-24.9]	[25-29.9]	[30-32.9]	[33-39.9]	[40-46]	[46+]

In a female patient with a weight related health problem, height 170 cm (5'7"), at what weight would you consider recommending weight loss advice? (Please tick one box only)

	68-72kg ❑	73-86kg ❑	87-95kg ❑	96-115kg ❑	116-134kg ❑	134+kg ❑
BMI	[24-24.9]	[25-29.9]	[30-32.9]	[33-39.9]	[40-46]	[46+]

Listed below are a number of interventions commonly used to help control weight. In general, how often do you use each of the interventions listed?: (Please circle the answer which best applies to you)

	Never					Always
General dietary advice (eg. reducing saturated fat intake)..	1	2	3	4	5	6	7
Eat less in general.....	1	2	3	4	5	6	7
Calorie controlled diet of *more than* a 1000 calories per day.....	1	2	3	4	5	6	7
Calorie controlled diet of *less than* a 1000 calories per day.....	1	2	3	4	5	6	7
Very Low Calorie diet (eg. the Cambridge diet).....	1	2	3	4	5	6	7
Exercise program.....	1	2	3	4	5	6	7
Referral to self-help group (eg. weight watchers).....	1	2	3	4	5	6	7
Surgical intervention (eg. gastric partitioning).....	1	2	3	4	5	6	7
Anorectic drugs.....	1	2	3	4	5	6	7

Other..... (Please state)

Listed below are a number of statements concerning beliefs towards diet, obesity and health. (Please circle the answer which best reflects your beliefs)

In comparison to patients of average weight, what are the chances that obese patients will suffer from the following health problems in the future?

	Much Below Average						Much Above Average
Coronary Heart Disease	1	2	3	4	5	6	7
Stroke	1	2	3	4	5	6	7
Hypertension	1	2	3	4	5	6	7
Diabetes Mellitus type 2	1	2	3	4	5	6	7
Joint Trauma	1	2	3	4	5	6	7
Certain types of Cancer	1	2	3	4	5	6	7
Psychological Problems	1	2	3	4	5	6	7

How serious a threat to health do you feel obesity is?

Not at all Serious	1	2	3	4	5	6	7	Extremely Serious

If someone is obese, how beneficial to health do you feel successful weight loss is?

Not at all Beneficial	1	2	3	4	5	6	7	Extremely Beneficial

How serious a threat to health do you feel an unhealthy diet is?

Not at all Serious	1	2	3	4	5	6	7	Extremely Serious

Overall, how beneficial to health do you feel a healthy diet is?

Not at all Beneficial	1	2	3	4	5	6	7	Extremely Beneficial

How preventable do you feel obesity is?

Completely Unpreventable	1	2	3	4	5	6	7 Completely Preventable

How treatable do you feel obesity is?

Completely Untreatable	1	2	3	4	5	6	7 Completely Treatable

Listed below are a number of statements relating to failure to lose weight. To what extent do you agree or disagree with each of the following statements?: (Please circle the answer which best reflects your beliefs)

	Strongly Disagree						Strongly Agree
If someone cannot lose weight, it is because they lack motivation...	1	2	3	4	5	6	7
If someone cannot lose weight, it is because they have not been given the proper guidance and support...	1	2	3	4	5	6	7
Failure to lose weight is largely due to the inadequacy of current weight loss methods...	1	2	3	4	5	6	7
Failure to lose weight is largely due to patient non-compliance with weight loss advice?...	1	2	3	4	5	6	7

Listed below are a number of statements regarding possible causes of obesity. To what extent do you agree or disagree that the following factors play a significant role in the development of obesity?: (Please circle the answer which best reflects your beliefs)

	Strongly Disagree						Strongly Agree
Excessive calorie intake.....	1	2	3	4	5	6	7
Eating too much of the wrong type of food (eg. junk food).....	1	2	3	4	5	6	7
Cultural factors (eg. differences in views about size).....	1	2	3	4	5	6	7
Eating for comfort.....	1	2	3	4	5	6	7
Genetics.....	1	2	3	4	5	6	7
Eating style (eg. binging).....	1	2	3	4	5	6	7
Hormonal problems.....	1	2	3	4	5	6	7
Increased fat cell number.....	1	2	3	4	5	6	7
Personality.....	1	2	3	4	5	6	7
Availability of high fat foods.	1	2	3	4	5	6	7
Low metabolic rate.....	1	2	3	4	5	6	7
Parental eating habits.....	1	2	3	4	5	6	7
Sedentary lifestyle.....	1	2	3	4	5	6	7
Lack of self control.....	1	2	3	4	5	6	7
Low socioeconomic status.....	1	2	3	4	5	6	7
Psychological problems (eg. poor self image).....	1	2	3	4	5	6	7

This section of the questionnaire is designed to find out more about you as an individual.

Which main nursing qualifications do you hold? (Please tick)

RGN/SRN ❑ SEN/EN ❑ ENB ❑ DN ❑ SCM ❑ HV ❑ RMN ❑
Other ❑ (Please state).....

What year did you qualify? (Please state).....

How long have you been working in general practice? (Please tick)
Less than 5 years ❑ 5-10 years ❑ 11-15 years ❑ More than 15 years ❑

How long have you been in your present job? (Please tick)
Less than 1 year ❑ 1-2 years ❑ 3-5 years ❑ More than 5 years ❑

How many hours do you work in an average week? (Please tick)
Less than 10 hours ❑ 10-20 hours ❑ 21-30 hours ❑ More than 30 hours ❑

What has been your primary source of information regarding weight loss/ dietary change advice? (Please tick)

Journals ❑ Colleagues ❑ Training Courses/Workshops/Seminars ❑
Medical School ❑ Other ❑ (Please state).....

Do you run a weight loss clinic in your practice? (Please tick). Yes ❑ No ❑

Are you, male ❑ or female ❑ What year were you born? (Please state) .....

How tall are you? (Please state).....

How much do you weigh? (Please state).....

In a typical week, approximately how much does your weight fluctuate? (Please tick) 0-1lbs ❑ 1.1-2lbs ❑ 2.1-3lbs ❑ 3.1-5lbs ❑ +5.1lbs ❑

Do you try to eat less at mealtimes than you would like to eat? (Please tick)
Never ❑ Seldom ❑ Sometimes ❑ Often ❑ Always ❑

Thank you for taking part in this survey. Any comments you may have about this questionnaire or your experiences are more than welcome.

APPENDIX B

This section asks you about what you are planning to do DURING THE NEXT MONTH.

[1] I want to raise the issue of weight loss with all overweight patients during the next month....

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

[2] I intend to raise the issue of weight loss with all overweight patients during the next month...

Definitely do not 1 2 3 4 5 6 7 Definitely do

[3] I am committed to raising the issue of weight loss with all overweight patients during the next month...

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

[4] I plan to raise the issue of weight loss with all overweight patients during the next month...

Definitely do not 1 2 3 4 5 6 7 Definitely do

[5] How likely is it that you will raise the issue of weight loss with all overweight patients during the next month...

Extremely unlikely 1 2 3 4 5 6` 7 Extremely likely

[6] I will raise the issue of weight loss with all overweight patients during the next month...

Definitely will not 1 2 3 4 5 6 7 Definitely will

This sections asks you about the views of people who are important to you, towards raising the issue of weight loss DURING THE NEXT MONTH.

[7] Most people who are important to me would approve of me raising the issue of weight loss with all overweight patients during the next month....

Disapprove 1 2 3 4 5 6 7 Approve

[8] Most people who are important to me think I should raise the issue of weight loss with all overweight patients during the next month...

Extremely unlikely	1	2	3	4	5	6`	7	Extremely likely

This section asks you about your general attitudes towards raising the issue of weight loss DURING THE NEXT MONTH.

[9] My raising the issue of weight loss with all overweight patients during the next month will be... *(please circle an answer for each of the six statements)*

[1]	Unpleasant	1	2	3	4	5	6	7	Pleasant
[2]	Dissatisfying	1	2	3	4	5	6	7	Satisfying
[3]	Worthless	1	2	3	4	5	6	7	Valuable
[4]	Desirable	1	2	3	4	5	6	7	Undesirable
[5]	Unimportant	1	2	3	4	5	6	7	Important
[6]	Rewarding	1	2	3	4	5	5	7	Unrewarding

This section asks you about how much control you feel you have over whether or not you raise the issue of weight loss DURING THE NEXT MONTH.

[10] I have complete control over whether or not I raise the issue of weight loss with all overweight patients during the next month...

Strongly disagree	1	2	3	4	5	6	7	Strongly agree

[11] Whether I do or do not I raise the issue of weight loss with all overweight patients during the next month is entirely up to me...

Strongly disagree	1	2	3	4	5	6	7	Strongly agree

[12] It is entireley my decision as to whether or not I raise the issue of weight loss with all overweight patients during the next month...

Strongly disagree	1	2	3	4	5	6	7	Strongly agree

[13] I am confident that I can raise the issue of weight loss with all overweight patients during the next month...

Strongly disagree	1	2	3	4	5	6	7	Strongly agree

[14] For me raising the issue of weight loss with all overweight patients

during the next month, will be...

Very difficult	1	2	3	4	5	6	7	Very easy

[15] I am certain that if I wanted to I could easily raise the issue of weight loss with all overweight patients during the next month...

Extremely uncertain	1	2	3	4	5	6	7	Extremely certain

[16] I am confident in my ability to raise the issue of weight loss with all overweight patients during the next month...

Extremely unconfident	1	2	3	4	5	6	7	Extremely confident

This section asks you what you think about obesity. Please remember there are no right or wrong answers.

[17] Overweight patients usually fail to lose weight because...*(please circle an answer for each of the sixteen statements below*)

	Strongly disagree						Strongly agree
[1] They do not try hard enough.....	1	2	3	4	5	6	7
[2] They do not know the best way to go about it.....	1	2	3	4	5	6	7
[3] They lose their motivation.....	1	2	3	4	5	6	7
[4] They do not follow the advice they are given.....	1	2	3	4	5	6	7
[5] They do not receive adequate help...	1	2	3	4	5	6	7
[6] They have no control over their weight.....	1	2	3	4	5	6	7
[7] Weight gain is permanent.....	1	2	3	4	5	6	7
[8] Weight loss cannot be sustained....	1	2	3	4	5	6	7
[9] They lack the correct information...	1	2	3	4	5	6	7
[10] They become despondent.....	1	2	3	4	5	6	7
[11] They do not receive adequate advice..	1	2	3	4	5	6	7

[18] What are the chances that overweight patients will suffer from the following health problems in the future? *(Please circle an answer for each of the fourteen statements below)*

		Much below average						Much above average
[1]	Heart attack.....	1	2	3	4	5	6	7
[2]	Hypertension.....	1	2	3	4	5	6	7
[3]	Diabetes Mellitus type 2.....	1	2	3	4	5	6	7
[4]	Certain types of cancer.....	1	2	3	4	5	6	7
[5]	High cholesterol.....	1	2	3	4	5	6	7
[6]	Anxiety/depression.....	1	2	3	4	5	6	7
[7]	Stroke.....	1	2	3	4	5	6	7
[8]	Depression.....	1	2	3	4	5	5	7
[9]	Gallstones.....	1	2	3	4	5	6	7
[10]	Osteoarthritis.....	1	2	3	4	5	6	7
[11]	Joint trauma.....	1	2	3	4	5	6	7

[19] To what extent do you think that the following are associated with being overweight? *(Please circle an answer for each of the five statements below)*

		Strongly disagree						Strongly agree
[1]	Breathlessness.....	1	2	3	4	5	6	7
[2]	Fatigue.....	1	2	3	4	5	6	7
[3]	Stiff joints.....	1	2	3	4	5	6	7
[4]	Sleep difficulties.....	1	2	3	4	5	6	7
[5]	Loss of strength.....	1	2	3	4	5	6	7

[20] How likely is it that the following factors play a significant role in the onset of obesity? *(Please circle an answer for each of the sixteen statements below)*

		Extremely unlikely						Extremely likely
[1]	Excessive calorie intake.....	1	2	3	4	5	6	7
[2]	Eating the wrong food.....	1	2	3	4	5	6	7
[3]	Eating for comfort.....	1	2	3	4	5	6	7
[4]	Genetic make-up.....	1	2	3	4	5	6	7
[5]	Eating too much.....	1	2	3	4	5	6	7
[6]	Hormonal problems.....	1	2	3	4	5	6	7
[7]	Increased number of fat cells..	1	2	3	4	5	6	7
[8]	Availability of high fat foods.....	1	2	3	4	5	6	7
[9]	Low metabolic rate.....	1	2	3	4	5	6	7
[10]	Eating when not hungry.....	1	2	3	4	5	6	7
[11]	Sedentary lifestyle.....	1	2	3	4	5	6	7
[12]	Eating fatty food.....	1	2	3	4	5	6	7
[13]	Lack of exercise.....	1	2	3	4	5	6	7
[14]	Low energy output.....	1	2	3	4	5	6	7
[15]	Natural body type.....	1	2	3	4	5	6	7

This section asks you about your current weight management practices. Please answer with reference to the PAST MONTH. Please remember there are no right or wrong answers.

[21] During the past month, I have raised the issue of weight loss with all overweight patients...

Very infrequently	1	2	3	4	5	6	7 Very frequently

[22] In an average week, how many patients do you give weight loss advice to?

None ❑ 1-2 ❑ 3-4 ❑ 5-7 ❑ 8-10 ❑ 11-15 ❑ More than 15 ❑

This final section is about you and your practice. Please remember that all of your answers will be treated with the strictest confidence.

[23] How long have you been working in general practice?

Less than 5 years ❑ 5-10 years ❑ more than 10 years ❑

[24] How many hours do you work in an average week?

Less than 10 hours ❑ 10-20 hours ❑ 21-30 hours ❑ More than 30 hours ❑

[25] Which main nursing qualifications do you hold?

RGN/SRN ❑ SEN/EN ❑ ENB ❑ DN ❑ SCM ❑ HV ❑ RMN ❑

[26] How old are you?.....

[27] How much do you weigh?.....

[28] How tall are you?.....

[29] Are you currently trying to lose weight? NO ❑ YES ❑

Thank you very much for taking the time to complete this questionnaire. Any comments you may have about weight management are more than welcome. Please check to make sure you have answered ALL the questions before you post your questionnaire in the FREEPOST envelope provided, to Roberta Hoppé, Department of General Practice, 5 Lambeth Walk, London SE11 2BR.

APPENDIX C

ELICITATION INTERVIEW

1. What makes it easy for you to give weight loss advice?

2. What makes it difficult for you to give weight loss advice?

3. What are the advantages for you in giving weight loss advice?

4. What are the disadvantages for you in giving weight loss advice?

5. Who do you think may have views on whether or not you should give weight loss advice?

6. What are the advantages / disadvantages of the patient for trying to lose weight?

Please complete all the questions by placing a circle around the number which best reflects how you feel. Remember there are no right or wrong answers.

SECTION 1. This section asks you about what you are planning to do during the NEXT MONTH.

[1] I want to raise the issue of weight loss with all overweight patients during the next month....

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

[2] I intend to raise the issue of weight loss with all overweight patients during the next month...

Definitely do not 1 2 3 4 5 6 7 Definitely do

[3] I am committed to raising the issue of weight loss with all overweight patients during the next month...

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

[4] I plan to raise the issue of weight loss with all overweight patients during the next month...

Definitely do not 1 2 3 4 5 6 7 Definitely do

[5] How likely is it that you will raise the issue of weight loss with all overweight patients during the next month...

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

SECTION 2. This section asks you about your general attitudes towards raising the issue of weight loss.

[1] My raising the issue of weight loss with all overweight patients during the next month will be... *(please circle an answer for each of the five statements)*

[1]	Unpleasant	1	2	3	4	5	6	7	Pleasant
[2]	Dissatisfying	1	2	3	4	5	6	7	Satisfying
[3]	Worthless	1	2	3	4	5	6	7	Valuable
[4]	Desirable	1	2	3	4	5	6	7	Undesirable
[5]	Unimportant	1	2	3	4	5	6	7	Important

[2] If during the next month you decided to wait for patients to raise the issue of weight loss before you mentioned it, how would you feel...
(please circle an answer for each of the six statements)

		Not at all						Extremely
[1]	Worried	1	2	3	4	5	6	7
[2]	Regretful	1	2	3	4	5	6	7
[3]	Tense	1	2	3	4	5	6	7
[4]	Guilty	1	2	3	4	5	6	7
[5]	Criticised	1	2	3	4	5	6	7
[6]	Disapproved of	1	2	3	4	5	6	7

SECTION 3. This section asks you about how much control you feel you have over whether or not you raise the issue of weight loss during the NEXT MONTH.

[1] I have complete control over whether or not I raise the issue of weight loss with all overweight patients...

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

[2] Whether I do or do not I raise the issue of weight loss with all overweight patients during the next month, is entirely up to me...

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

[3] I am confident that I can raise the issue of weight loss with all overweight patients during the next month...

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

[4] Raising the issue of weight loss with all overweight patients during the next month, will be...

Very difficult 1 2 3 4 5 6 7 Very easy

SECTION 4. This next section asks you about the outcomes you expect if you raise the issue of weight loss during the NEXT MONTH.

If during the next month, I raise the issue of weight loss with all overweight patients... *(please circle an answer for each of the seventeen statements)*

	Extremely unlikely						Extremely likely
[1] I will be conscious of my own weight...	1	2	3	4	5	6	7
[2] I will be providing a service to patients...	1	2	3	4	5	6	7
[3] I will be successful in helping patients to lose weight...	1	2	3	4	5	6	7
[4] I will be helping to improve the patients wellbeing...	1	2	3	4	5	6	7
[5] I will be wasting my time...	1	2	3	4	5	6	7
[6] I will find that patients will want to lose weight...	1	2	3	4	5	6	7
[7] I will be reminded of my own weight loss attempts...	1	2	3	4	5	6	7
[8] I will find that patients will try to lose weight...	1	2	3	4	5	6	7
[9] I will get job satisfaction...	1	2	3	4	5	6	7
[14] I will be conscious of my own eating behaviour...	1	2	3	4	5	6	7
[11] I will feel disillusioned with weight management...	1	2	3	4	5	6	7
[12] I will fail to bring about behavioural change...	1	2	3	4	5	6	7
[13] I will worry about my own weight...	1	2	3	4	5	6	7
[14] I will be helping patients to avoid illness...	1	2	3	4	5	6	7
[15] I will find that patients will follow my advice....	1	2	3	4	5	6	7
[16] I will feel that my job is worthwhile...	1	2	3	4	5	6	7
[17] I will feel that I have given advice appropriately...	1	2	3	4	5	6	7

SECTION 5. This section asks you to evaluate how you feel towards the possible outcomes of raising the issue of weight loss with all overweight patients during the NEXT MONTH.

How pleasant/unpleasant are the following to you...? *(please circle an answer for each of the seventeen statements)*

	Unpleasant						Pleasant
[1] Being conscious of my own weight is...	1	2	3	4	5	6	7
[2] Providing a service to patients is...	1	2	3	4	5	6	7
[3] Being successful in helping patients to lose weight is...	1	2	3	4	5	6	7
[4] Helping to improve the patients wellbeing is...	1	2	3	4	5	6	7
[5] Feeling like I am wasting my time is...	1	2	3	4	5	6	7
[6 Having patients who want to lose weight is....	1	2	3	4	5	6	7
[7] Being reminded of my own weight loss attempts is...	1	2	3	4	5	6	7
[8] Having patients who try to lose weight is...	1	2	3	4	5	6	7
[9] Getting job satisfaction is...	1	2	3	4	5	6	7
[14] Being conscious of my own eating behaviour is...	1	2	3	4	5	6	7
[11] Feeling disillusioned with weight management is...	1	2	3	4	5	6	7
[12] Failing to bring about behavioural change is...	1	2	3	4	5	6	7
[13] Worrying about my own weight is...	1	2	3	4	5	6	7
[14] Helping patients to avoid illness is...	1	2	3	4	5	6	7
[15] Having patients that follow my advice is....	1	2	3	4	5	6	7
[16] Feeling that my job is worthwhile is...	1	2	3	4	5	6	7
[17] Feeling as though I've given appropriate advice is...	1	2	3	4	5	6	7

SECTION 6. This sections asks you about the weight management views of people who are important to you, towards raising the issue of weight loss during the NEXT MONTH.

[1] Most people who are important to me would approve of me raising the issue of weight loss with all overweight patients....

Disapprove 1 2 3 4 5 6 7 Approve

[2] Most people who are important to me think I should raise the issue of weight loss with all overweight patients...

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

[3] Most other health professionals raise the issue of weight loss with all overweight patients...

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

[4] In comparison to other health professionals, I raise the issue of weight loss with all over weight patients...

Less frequently 1 2 3 4 5 6 7 More frequently

[1] I think I should raise the issue of weight loss with all overweight patients.....

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

[2] I feel obliged to raise the issue of weight loss with all overweight patients...

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

SECTION 7. The next section asks you about specific groups of people whose views on raising the issue of weight loss during the NEXT MONTH may be important to.

[1] The following groups of people think I should raise the issue of weight loss with all overweight patients... *(please circle an answer for each of the four groups of people)*

		Extremely unlikely						Extremely likely
[a]	My patients....	1	2	3	4	5	6	7
[b]	Other practice nurses...	1	2	3	4	5	6	7
[c]	Doctors in my practice...	1	2	3	4	5	6	7
[d]	My local health authority	1	2	3	4	5	6	7

[2] I want to do what the following groups of people think I should do...
(please circle an answer for each of the four groups of people)

		Strongly disagree						Strongly agree
[a]	My patients....	1	2	3	4	5	6	7
[b]	Other practice nurses...	1	2	3	4	5	6	7
[c]	Doctors in my practice...	1	2	3	4	5	6	7
[d]	My local health authority	1	2	3	4	5	6	7

SECTION 8. This section asks you about whether or not you usually encounter a number of potential barriers to raising the issue of weight loss.

When raising the issue of weight loss... *(please circle an answer for each of the nine statements)*

	Definitely no						Definitely yes
[1] I often feel that I am a failure at weight management...	1	2	3	4	5	6	7
[2] I often feel that many of my patients have concerns which are more important to them than their weight..	1	2	3	4	5	6	7
[3] I often don't have enough time to offer weight loss advice to all overweight patients....	1	2	3	4	5	6	7
[4] I often feel that most of my patients have no intention to try and lose weight....	1	2	3	4	5	6	7
[5] I often find weight loss consultations stressful...	1	2	3	4	5	6	7
[6] I often feel that most of my patients have a negative attitude towards weight loss...	1	2	3	4	5	6	7
[7] I often feel like weight management is a waste of time...	1	2	3	4	5	6	7
[8] I often feel that most of my patients are not motivated to lose weight...	1	2	3	4	5	6	7
[9] I often find that other work pressures get in the way of weight management....	1	2	3	4	5	6	7

SECTION 9. This section asks you about how confident you are that you can overcome the following potential barriers and still raise the issue of loss during the NEXT MONTH

I am confident that I could raise the issue of weight loss next month with all overweight patients despite... *(please circle an answer for each of the nine statements)*

	Strongly disagree						Strongly agree
[1] Feeling that I have failed at weight management in the past...	1	2	3	4	5	6	7
[2] Having patients with concerns which are more important to them than their weight...	1	2	3	4	5	6	7
[3] Not having enough time during surgery...	1	2	3	4	5	6	7
[4] Having patients who have no intentions to try and lose weight...	1	2	3	4	5	6	7
[5] Feeling stressed...	1	2	3	4	5	6	7
[6] Having patients with a negative attitude towards weight loss..	1	2	3	4	5	6	7
[7] Feeling like weight management is a waste of time...	1	2	3	4	5	6	7
[8] Having patients who are not motivated to lose weight...	1	2	3	4	5	6	7
[9] Other pressures of work....	1	2	3	4	5	6	7

SECTION 10. This section asks you about your current weight management practices.

During the last month, I have raised the issue of weight loss with all overweight patients...

Very infrequently	1	2	3	4	5	6	7	Very frequently

SECTION 11. This final section is about you. Please remember that all of your answers will be treated with the strictest confidence.

[1] How old are you?.....

[2] How much do you weigh?.....

[3] How tall are you?.....

[4] Are you currently trying to lose weight? NO ❑ YES ❑

[5] In a typical week, approximately how much does your weight fluctuate?

0 - 1 Lb ❑ 1.1 - 2 Lbs ❑ 2.1 - 3 Lbs ❑ 3.1 - 5 Lbs ❑ +5 Lbs ❑

[6] Finally, to what extent do you agree/disagree with each of the following statements?

	Disagree				Agree
[a] I always try to eat less at meal times than I would like to eat...	1	2	3	4	5
[b] I feel as though I am always trying to lose weight...	1	2	3	4	5
[c] I am a weight conscious person...	1	2	3	4	5
[d] I am the sort of women who likes to keep a check on her weight...	1	2	3	4	5

Thank you very much for taking the time to complete this questionnaire. Your help is much appreciated. Please check to make sure you have answered ALL the questions before you post your questionnaire in the FREEPOST envelope provided.

APPENDIX D

Practice Nurse Questionnaire - ABOUT THE PATIENT

Please can you complete the following details on the first patient you give weight loss advice to today. Please can you complete this information as soon as possible after you have seen the patient.

PATIENT Details

1. Patient's sex: Female ❑ Male ❑

2. Patient's age .....

3. Patient's weight ..... Don't know ❑

4. Patient's height ..... Don't know ❑

5. Patient's BMI ..... Don't know ❑

6. Who was the first person to suggest the patient lose weight? (Tick one box only)

Did you suggest it?	NO ❑ YES ❑
Did a GP or other health professional suggest it?	NO ❑ YES ❑
Did the patient suggest it?	NO ❑ YES ❑

7. During the consultation what questions did you ask the patient? Did you ask them about any of the following?

- **Did you ask the patient about their physical health?** NO ❑ YES ❑

- **Did you ask about how they feel?**
(eg. their mood, body image, confidence etc) NO ❑ YES ❑

- **Did you ask about what they normally eat?** NO ❑ YES ❑

- **Did you ask anything else about their eating behaviour?**
(eg. whether they had been on a diet before or whether they have had eating 'binges etc) NO ❑ YES ❑

- **Did you ask about whether it was the right time for them to lose weight?**
(eg. whether they had support from family/ friends etc.) NO ❑ YES ❑

The following questions ask you about the weight management advice you have given to this patient.

8. What weight loss advice did you recommend to this patient? (You may tick as many boxes as necessary).

Did you recommend....

Control their calorie intake	NO ❑ YES ❑
Eat less in general	NO ❑ YES ❑
Changing the content of the diet (eg. eat less fat/more vegetables)	NO ❑ YES ❑
Changing the pattern of eating (eg. eat main meal midday)	NO ❑ YES ❑
Substitute certain foods (eg. snacks with fruit)	NO ❑ YES ❑
General nutritional advice (eg. information about a balanced diet)	NO ❑ YES ❑
Undertake an exercise programme	NO ❑ YES ❑

9. How confident did you feel giving weight loss advice to this patient?

Not at all Confident	1	2	3	4	5	6	7	Extremely Confident

10. How pleased are you with the consultation with this patient?

Not at all Pleased	1	2	3	4	5	6	7	Extremely Pleased

11. How pleased do you think the patient was with the consultation?

Not at all Pleased	1	2	3	4	5	6	7	Extremely Pleased

12. In your opinion, how likely is it that this patient will follow your advice?

Not at all Likely	1	2	3	4	5	6	7	Extremely Likely

13. In your opinion, how likely is it that this patient will lose weight in the next 6 months?

Not at all Likely	1	2	3	4	5	6	7	Extremely Likely

Below are listed a number of statements about giving weight loss advice. Please indicate how much you agree or disagree with the following statements about the weight loss advice that you have given.

14. This patient seemed particularly interested in losing weight in this way...

Totally Disagree	1	2	3	4	5	6	7	Totally Agree

16. This patient will be able to follow my advice easily...

Totally Disagree	1	2	3	4	5	6	7	Totally Agree

Thank you for taking the time to fill in this questionnaire, any comments you would like to make would be most welcome. Please return the questionnaire in the FREEPOST envelope provided - NO STAMP needed.

PATIENT QUESTIONNAIRE

Please think about the your visit to the practice nurse, the things you talked about and the advice you were given.

1. How long did you spend with the practice nurse? .....mins

2. During the consultation with the practice nurse, what questions were you asked? Do you remember being asked questions about any of the following...

●Were you asked about your physical health?	NO ❑ YES ❑
●Were you asked about how you feel (*eg. about your mood, confidence, body image, etc*)?	NO ❑ YES ❑
●Were you asked about what you normally eat?	NO ❑ YES ❑
●Were you asked anything else about your eating behaviour (*eg. whether you had been on a diet before or whether you have had eating "binges" etc.*)?	NO ❑ YES ❑
●Were you asked about whether it was the right time for you to lose weight (*eg. whether you have time to devote to weight control or support of family/friends etc*)?	NO ❑ YES ❑

3. What did the practice nurse recommend that you do to lose weight? (You may tick as many boxes as necessary).

Was it recommended that you should...

Control your calorie intake?	NO ❑ YES ❑
Eat less in general?	NO ❑ YES ❑
Change the content of your diet? (eg. eat less fat, eat more vegetables).	NO ❑ YES ❑
Change your pattern of eating? (eg. eat main meal midday, eat breakfast).	NO ❑ YES ❑
Eat certain foods such as fruit instead of other foods such as crisps?	NO ❑ YES ❑
Eat healthy food in general?	NO ❑ YES ❑
Undertake an exercise programme?	NO ❑ YES ❑

5. Was a target weight agreed? NO ❑ YES ❑

6. Was a weekly level of weight loss agreed? NO ❑ YES ❑

7. Were you given any written information? NO ❑ YES ❑

8. Was a follow-up appointment made for you? NO ❑ YES ❑

9. Overall, how satisfied are you with the advice you received?

Not at all Satisfied	1	2	3	4	5	6	7	Extremely Satisfied

10. Overall, how pleased were you with the consultation?

Not at all Pleased	1	2	3	4	5	6	7	Extremely Pleased

11. Overall, how pleased do you think the practice nurse was with the consultation?

Not at all Pleased	1	2	3	4	5	6	7	Extremely Pleased

12. How likely is it that you will follow the advice?

Not at all Likely	1	2	3	4	5	6	7	Extremely Likely

13. How confident are you that you can lose weight?

Not at all Confident	1	2	3	4	5	6	7	Extremely Confidant

14. How likely is it that you will lose weight in the next 6 months?

Not at all Likely	1	2	3	4	5	6	7	Extremely Likely

Please indicate how much you agree or disagree with the following statements about the weight loss advice that the practice nurse has given you.

15. I was particularly interested in losing weight in this way...

Totally Disagree	1	2	3	4	5	6	7	Totally Agree

16. I will be able to follow the practice nurses suggestions easily...

Totally Disagree	1	2	3	4	5	6	7	Totally Agree

Thank you for taking the time to fill in this questionnaire, any comments you would like to make would be most welcome. Please return the questionnaire using the FREEPOST envelope provided - NO STAMP needed!

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